

High Technology Business Scan



March 19, 2010



Goal

- Determine the data sources available within the Department of Labor relevant to high-tech.
- Analyze the accessibility of various types of data.
- Provide an overview of the data available with multiple breakdowns.



Data Sources



Data Readily Available In-House:

- Establishments, Covered Employment and Earnings (QCEW)
- Employment and Wages by Occupations (OES)
- Projections on occupations and industries, short- and long-term
- Export information for all states (Global Trade Information Services and U.S. Census Bureau)

Data Available for Purchase

- High-tech industries and occupations in other states and complete employment (EMSI)



High Technology Taxonomy

- Daniel Hecker, BLS Economist
- “High-technology employment, a NAICS-based update,” *Monthly Labor Review* 2005
- 71 SOC codes identified as technology-oriented occupations
- 46 industries with high proportions of technology-oriented occupations



High-Tech Occupations



- Computer and Mathematical Occupations
- Architecture and Engineering Occupations
- Life, Physical and Social Science Occupations



Computer and Mathematical Occupations



- 11–3021 Computer and information systems managers
- **11–9041 Engineering managers**
- 11–9121 Natural sciences managers
- 15–1011 Computer and information scientists, research
- **15–1021 Computer programmers**
- **15–1031 Computer software engineers, applications**
- **15–1032 Computer software engineers, systems software**
- 15–1041 Computer support specialists
- 15–1051 Computer systems analysts
- **15–1061 Database administrators**
- 15–1071 Network and computer systems administrators
- 15–1081 Network systems and data communications analysts
- 15–2011 Actuaries
- 15–2021 Mathematicians
- 15–2031 Operations research analysts
- 15–2041 Statisticians
- 15–2091 Mathematical technicians



Architecture and Engineering Occupations



- 17–2021 Agricultural engineers
- 17–2031 Biomedical engineers
- 17–2041 Chemical engineers
- 17–2051 Civil engineers
- **17–2061 Computer hardware engineers**
- 17–2071 Electrical engineers
- 17–2072 Electronics engineers, except computer
- 17–2081 Environmental engineers
- 17–2111 Health and safety engineers, except mining safety engineers and inspectors
- 17–2112 Industrial engineers
- 17–2121 Marine engineers and naval architects
- 17–2131 Materials engineers
- **17–2141 Mechanical engineers**
- 17–2151 Mining and geological engineers, including mining safety engineers
- **17–2161 Nuclear engineers**
- 17–2171 Petroleum engineers
- 17–3011 Architectural and civil drafters
- 17–3012 Electrical and electronics drafters
- 17–3013 Mechanical drafters
- 17–3021 Aerospace engineering and operations technicians
- 17–3022 Civil engineering technicians
- 17–3023 Electrical and electronic engineering technicians
- **17–3024 Electromechanical technicians**
- **17–3025 Environmental engineering technicians**
- 17–3026 Industrial engineering technicians
- 17–3027 Mechanical engineering technicians
- 17–3031 Surveying and mapping technicians



Life, Physical, and Social Science Occupations



- **19–1011 Animal scientists**
- 19–1012 Food scientists and technologists
- 19–1013 Soil and plant scientists
- 19–1021 Biochemists and biophysicists
- **19–1022 Microbiologists**
- 19–1023 Zoologists and wildlife biologists
- 19–1031 Conservation scientists
- **19–1032 Foresters**
- 19–1041 Epidemiologists
- 19–1042 Medical scientists, except epidemiologists
- 19–2011 Astronomers
- **19–2012 Physicists**
- 19–2021 Atmospheric and space scientists
- **19–2031 Chemists**
- 19–2032 Materials scientists
- 19–2041 Environmental scientists and specialists, including health
- 19–2042 Geoscientists, except hydrologists and geographers
- 19–2043 Hydrologists
- 19–4011 Agricultural and food science technicians
- 19–4021 Biological technicians
- 19–4031 Chemical technicians
- 19–4041 Geological and petroleum technicians
- 19–4051 Nuclear technicians
- 19–4091 Environmental science and protection technicians, including health
- 19–4092 Forensic science technicians
- 19–4093 Forest and conservation technicians



High-Tech Industries

- 46 industries with high proportions of technology oriented occupations
- Industry considered high-tech if employment in technology oriented occupations accounted for a proportion of that industry's total employment that was **at least twice the 4.9% average** for all industries



Levels of High-Tech



- Level I (14 industries) has a proportion of high-tech occupations that is at least five times the average or greater
- Level II (12 industries) between three and 4.9 times the average
- Level III (20 industries) between two and 2.9 times the average

High-Tech Industries: Level I



- 3254 - Pharmaceutical and Medicine Manufacturing
- **3341 - Computer and Peripheral Equipment Manufacturing**
- 3342 - Communications Equipment Manufacturing
- **3344 - Semiconductor and Other Electronic Component Manufacturing**
- 3345 - Navigational, Measuring, Electromedical and Control Instruments Manufacturing
- 3364 - Aerospace Product and Parts Manufacturing
- 5112 - Software Publishers
- 5179 - Other Telecommunications
- 5182 - Data Processing, Hosting and Related Services
- 5191 - Other Information Services
- **5413 - Architectural, Engineering and Related Services**
- **5415 - Computer Systems Design and Related Services**
- **5417 - Scientific Research and Development Services**

High-Tech Industries: Level II



- 1131 - Timber Tract Operations
- 1132 - Forest Nurseries and Gathering of Forest Products
- 2111 - Oil and Gas Extraction
- **2211 - Electric Power Generation, Transmission and Distribution**
- 3251 - Basic Chemical Manufacturing
- 3252 - Resin, Synthetic Rubber and Artificial Synthetic Fibers and Filaments Manufacturing
- 3332 - Industrial Machinery Manufacturing
- **3333 - Commercial and Service Industry Machinery Manufacturing**
- 3343 - Audio and Video Equipment Manufacturing
- 3346 - Manufacturing and Reproducing Magnetic and Optical Media
- **4234 - Professional and Commercial Equipment and Supplies Merchant Wholesalers**
- **5416 - Management, Scientific and Technical Consulting Services**

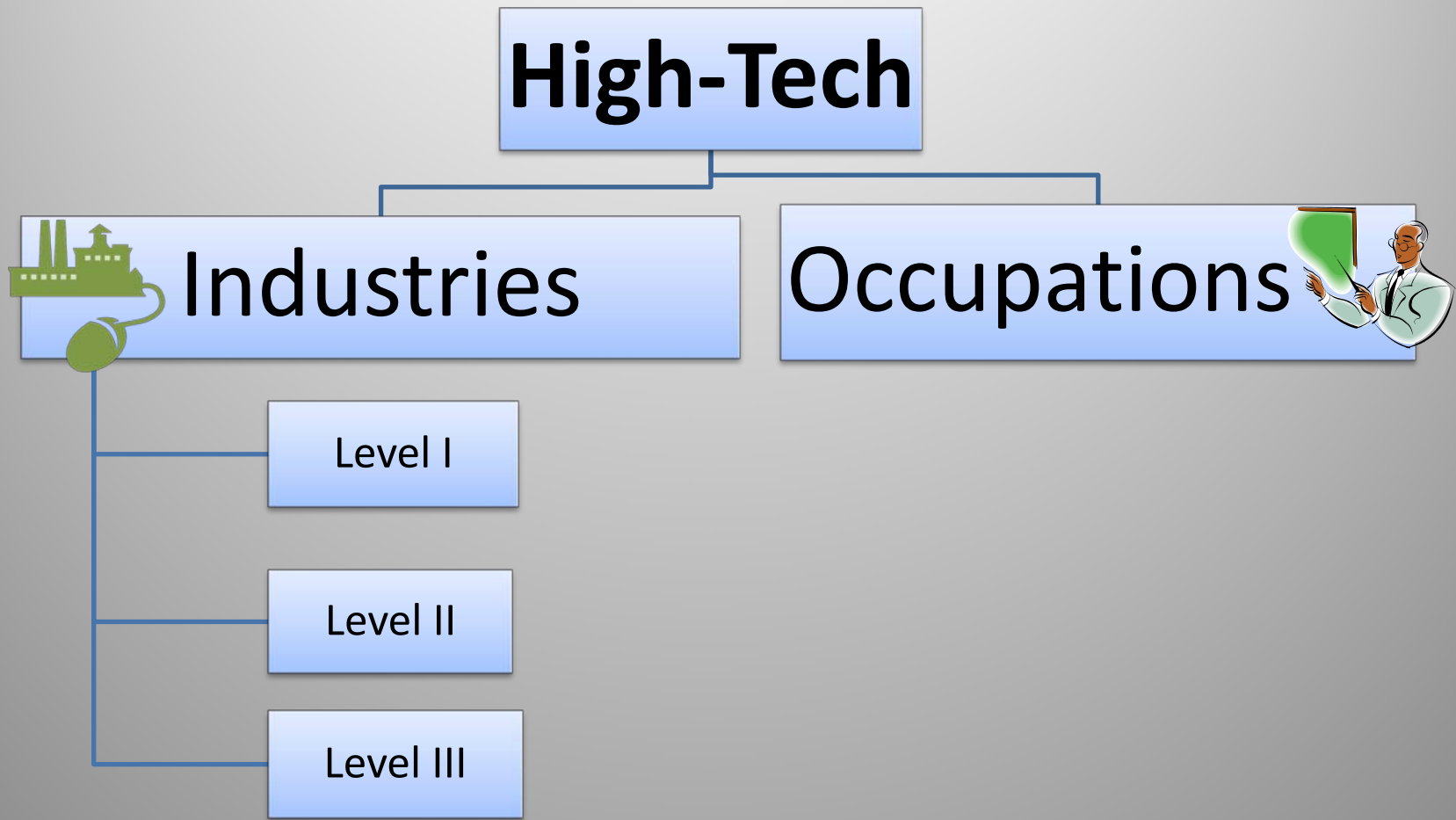


High-Tech Industries: Level III



- 3241 Petroleum and Coal Products Manufacturing
- **3253 Pesticide, Fertilizer, and Other Agricultural Chemical Manufacturing**
- 3255 Paint, Coating, and Adhesive Manufacturing
- 3259 Other Chemical Product and Preparation Manufacturing
- 3336 Engine, Turbine, and Power Transmission Equipment Manufacturing
- 3339 Other General Purpose Machinery Manufacturing
- 3353 Electrical Equipment Manufacturing
- 3369 Other Transportation Equipment Manufacturing
- 4861 Pipeline Transportation of Crude Oil
- 4862 Pipeline Transportation of Natural Gas
- 4869 Other Pipeline Transportation
- **5171 Wired Telecommunications Carriers**
- 5172 Wireless Telecommunications Carriers (except Satellite)
- 5174 Satellite Telecommunications
- 5211 Monetary Authorities-Central Bank
- 5232 Securities and Commodity Exchanges
- **5511 Management of Companies and Enterprises**
- 5612 Facilities Support Services
- **8112 Electronic and Precision Equipment Repair and Maintenance**

High-Tech Taxonomy





High Technology Industries



Establishments



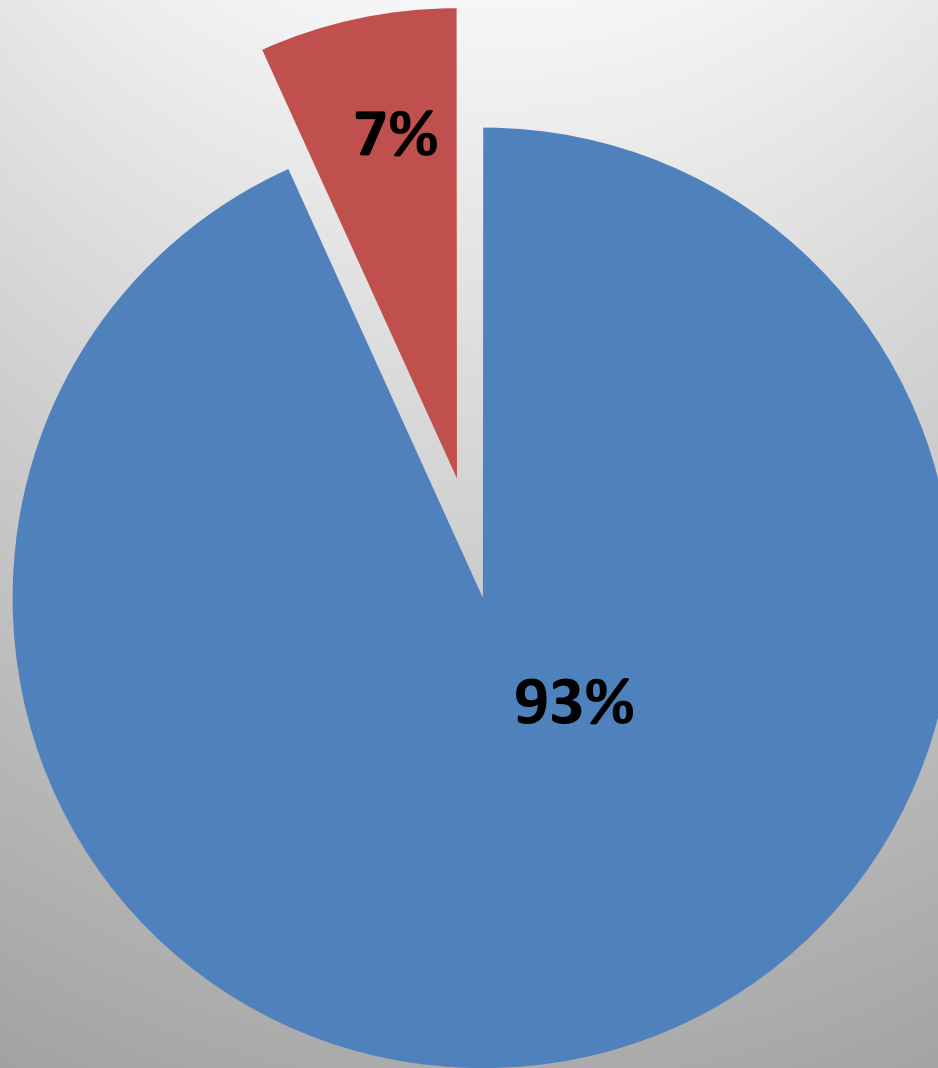
Employment



Earnings



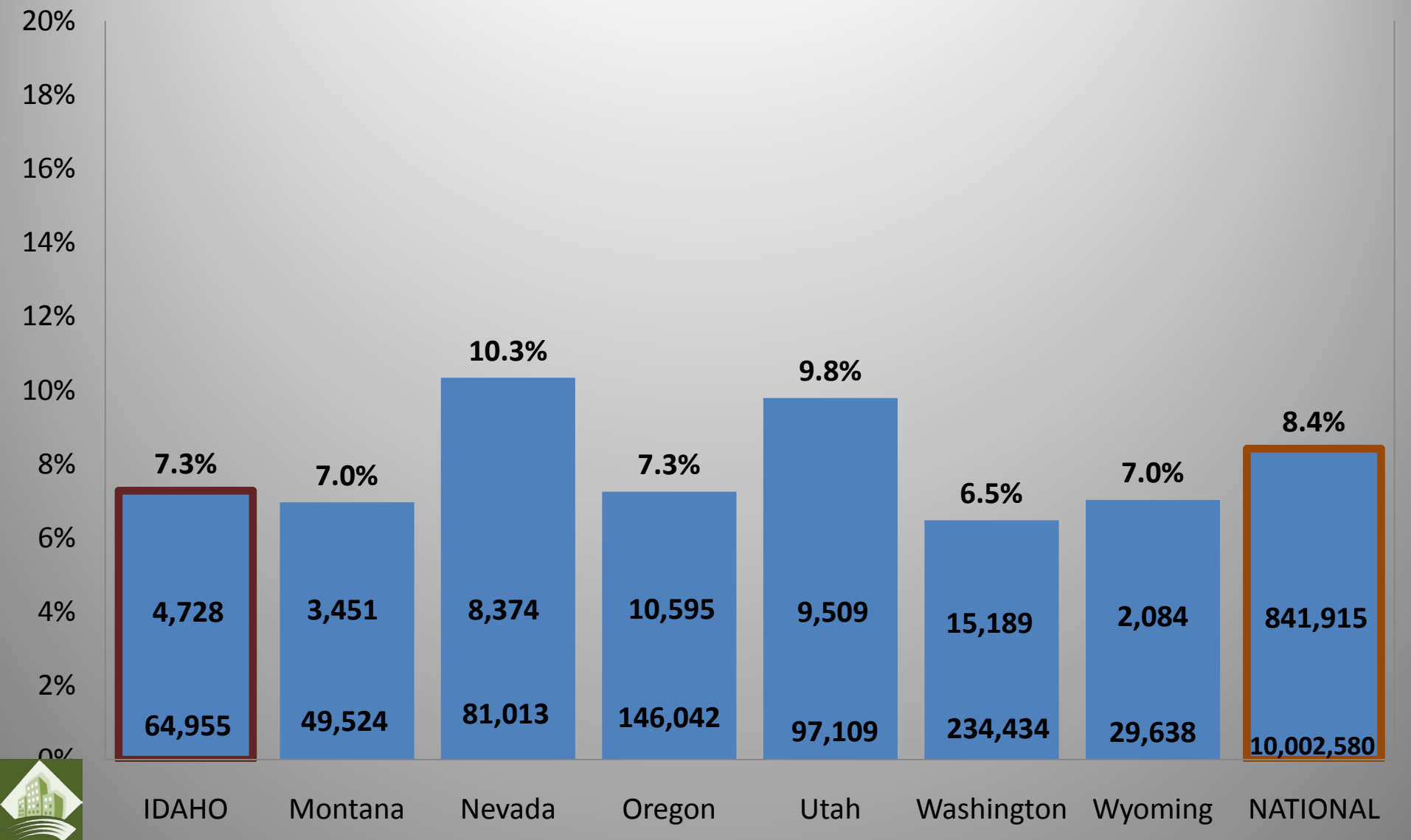
Industry: Percent of High-Tech Establishments



■ All Idaho Establishments (64,955)

■ High-Tech Idaho Establishments (4,728)

Industry: Percent of High-Tech Establishments to Total Establishments (2008)





High-Tech Industry Establishments National Ranking



2006

- 7.6%
- 27th in US

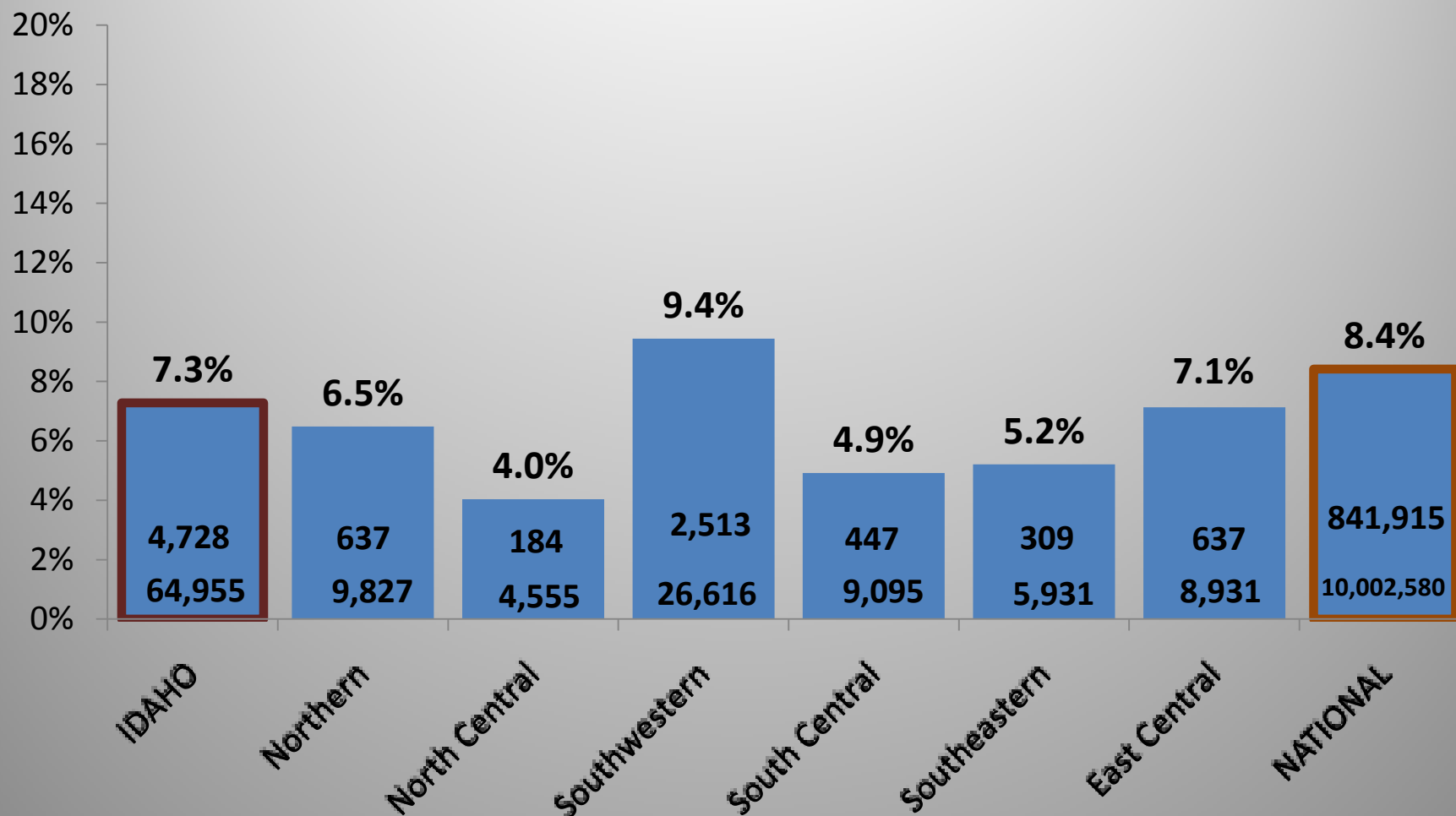
2008

- 7.3%
- 31st in US



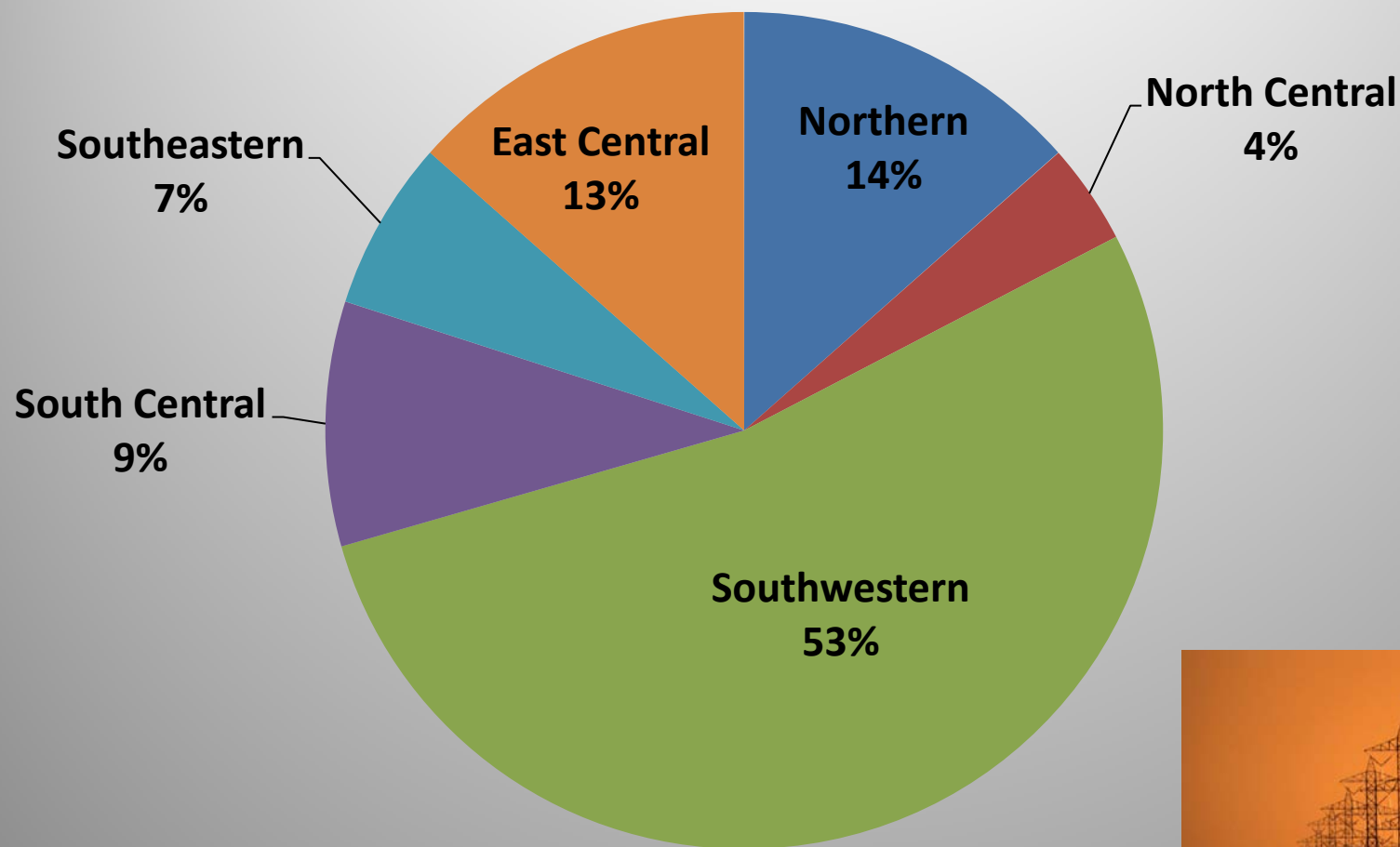


Industry: Percent of High-Tech Establishments to Total Regional Establishments (2008)



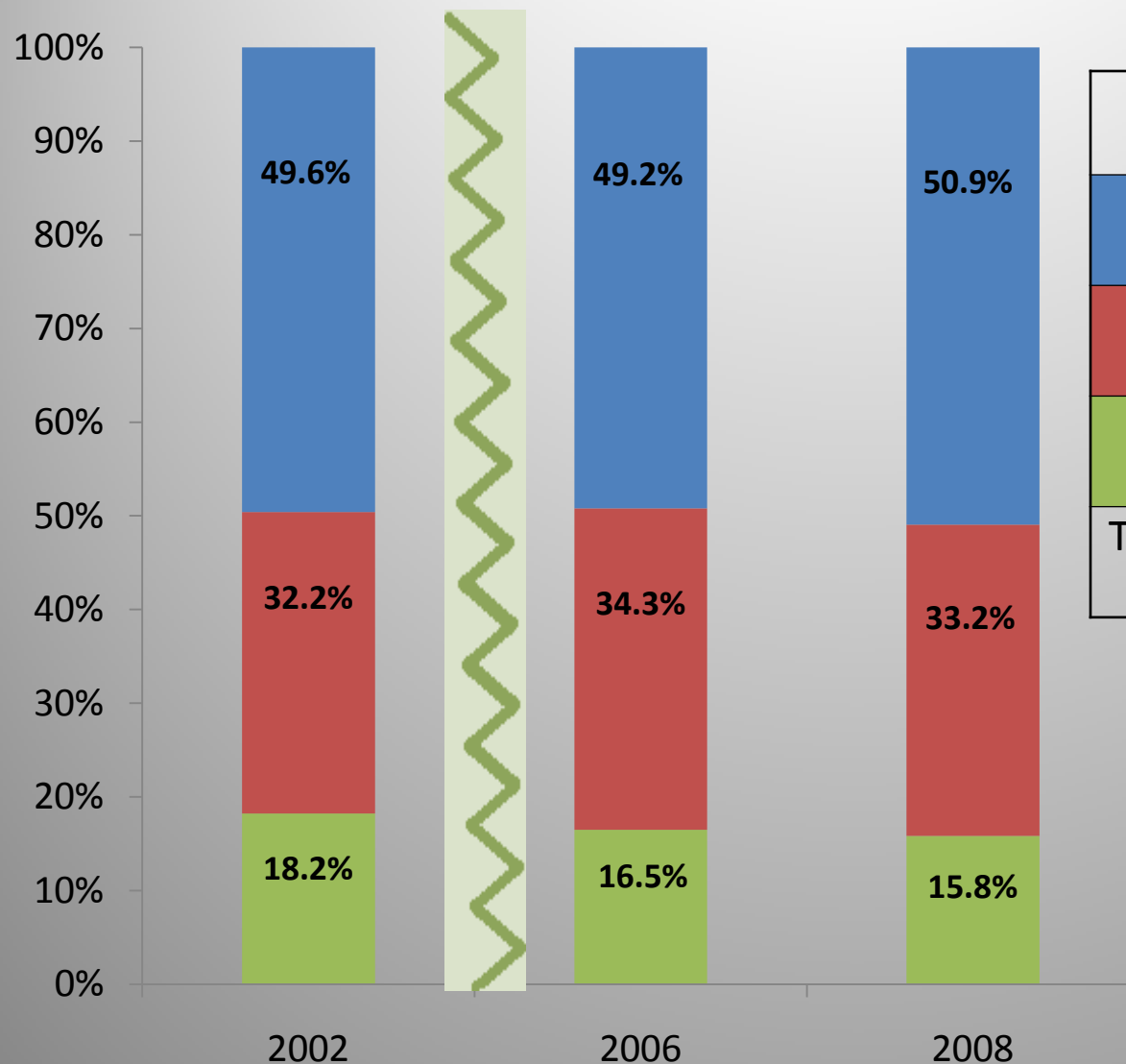


Industry: Distribution of High-Tech Establishments





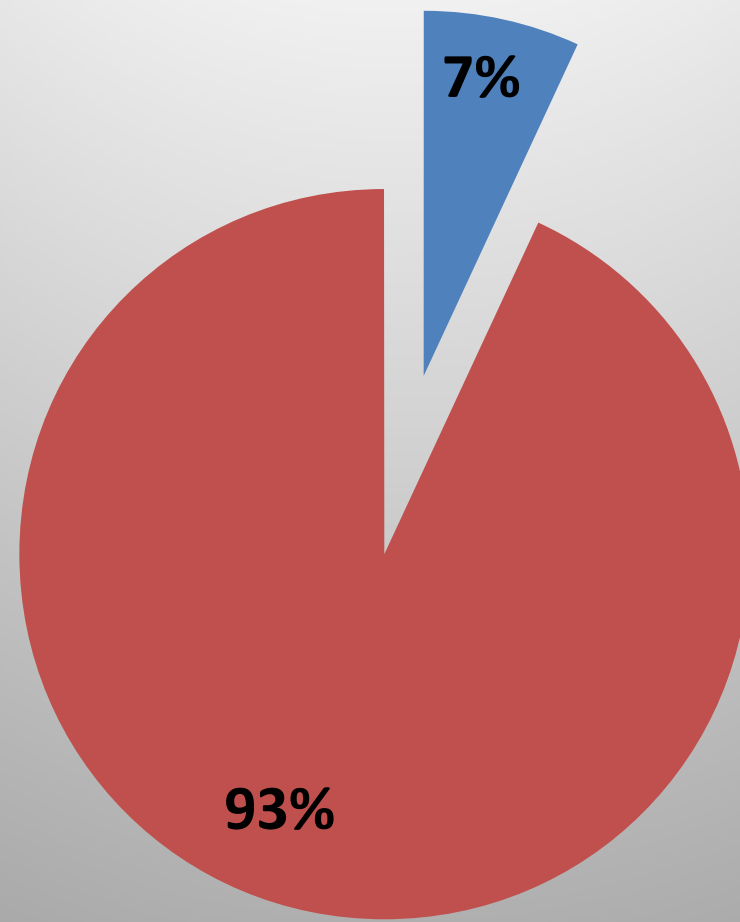
Industry: Distribution of High-Tech Establishments by Level



		2002	2006	2008
	Level 1	1,550	2,012	2,355
	Level 2	1,006	1,404	1,535
	Level 3	570	674	733
Total High-Tech		3,125	4,090	4,623



Industry: Percent of High-Tech Employment

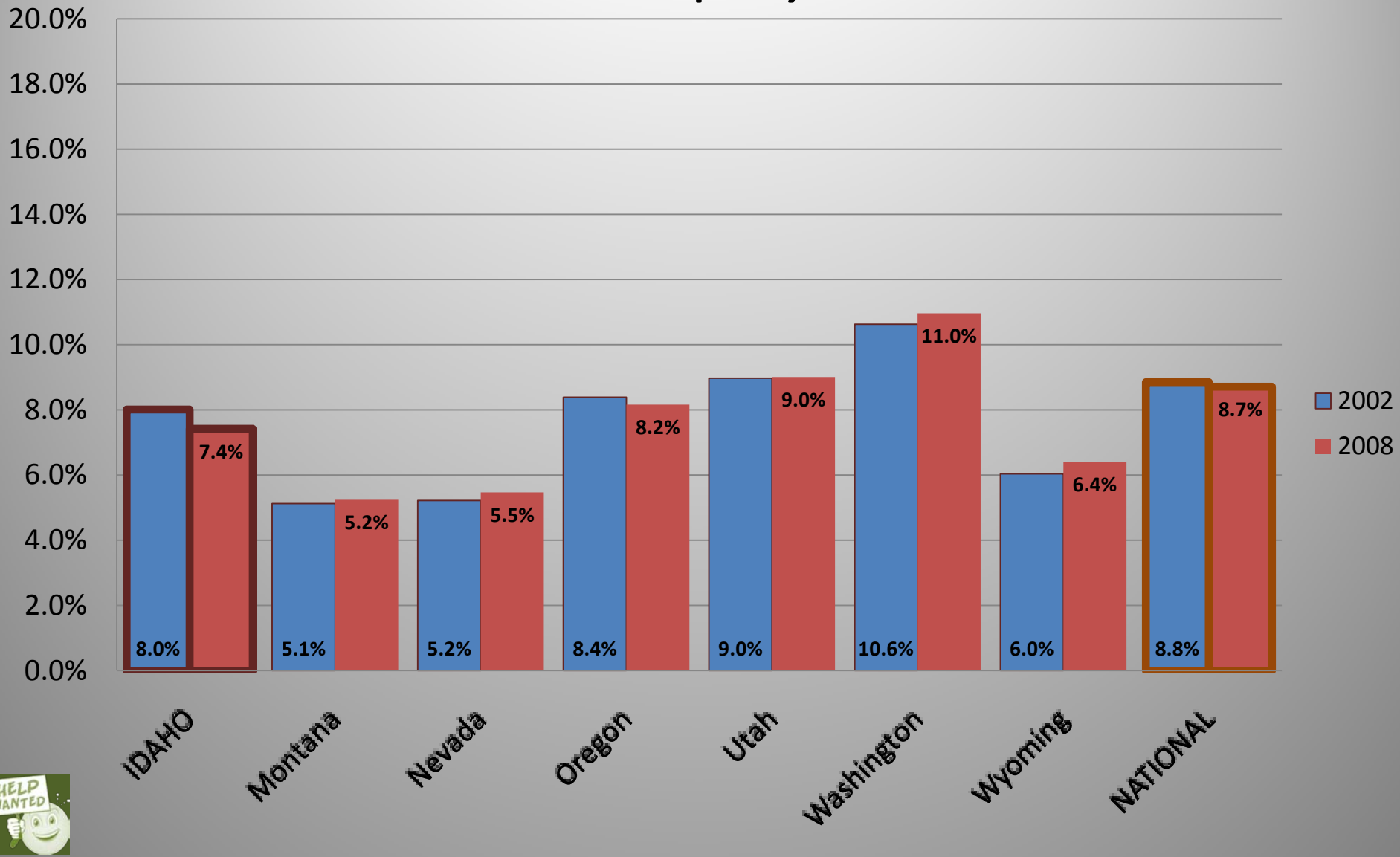


■ High-Tech Employment (68,866)

■ Total Employment (928,030)



Industry: Percent of High-Tech Employment to Total Employment





Percent of High-Tech Employment to Total Employment, National Ranking



2006

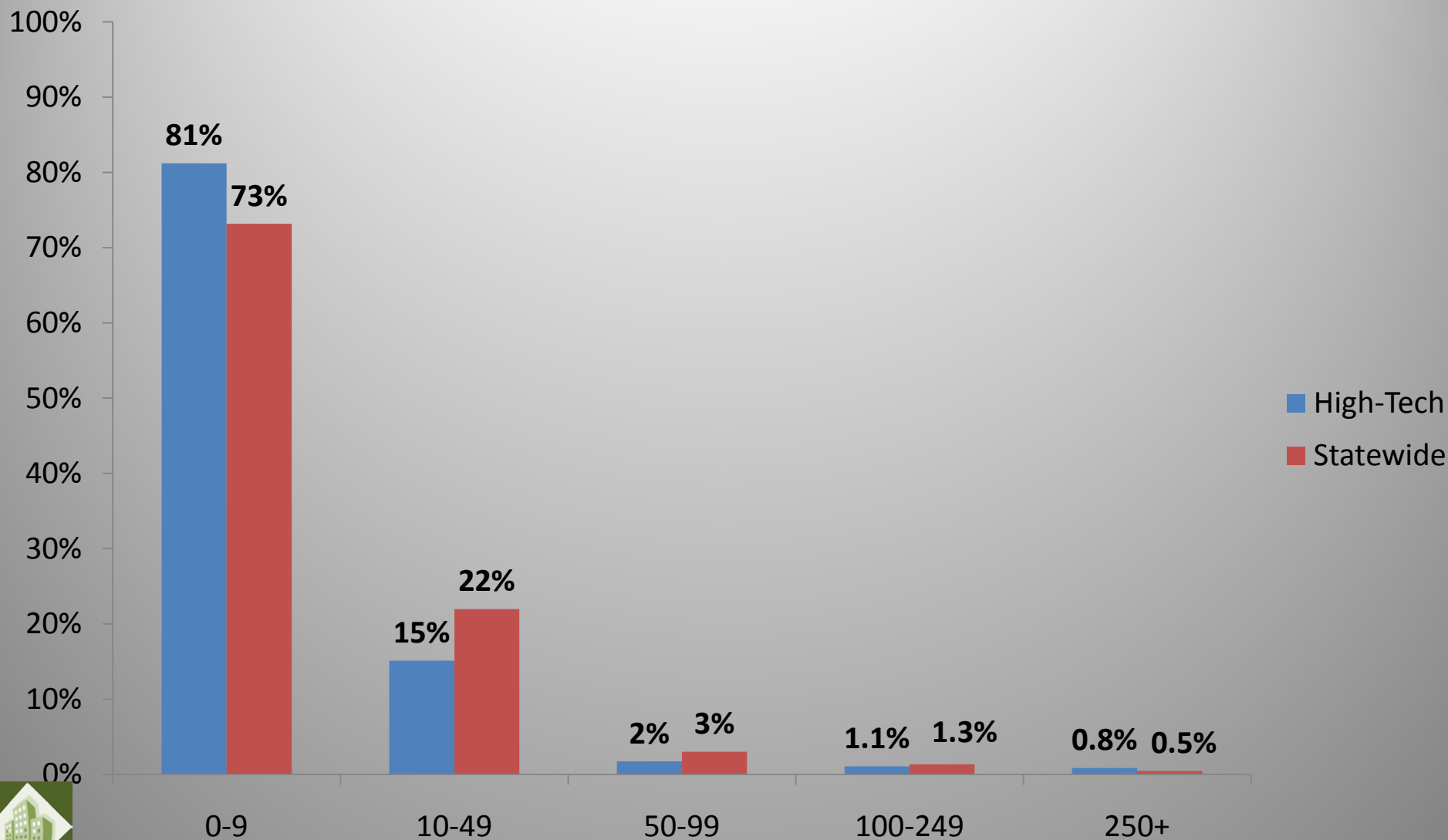
- 8.5%
- 23rd in US

2008

- 7.4%
- 29th in US

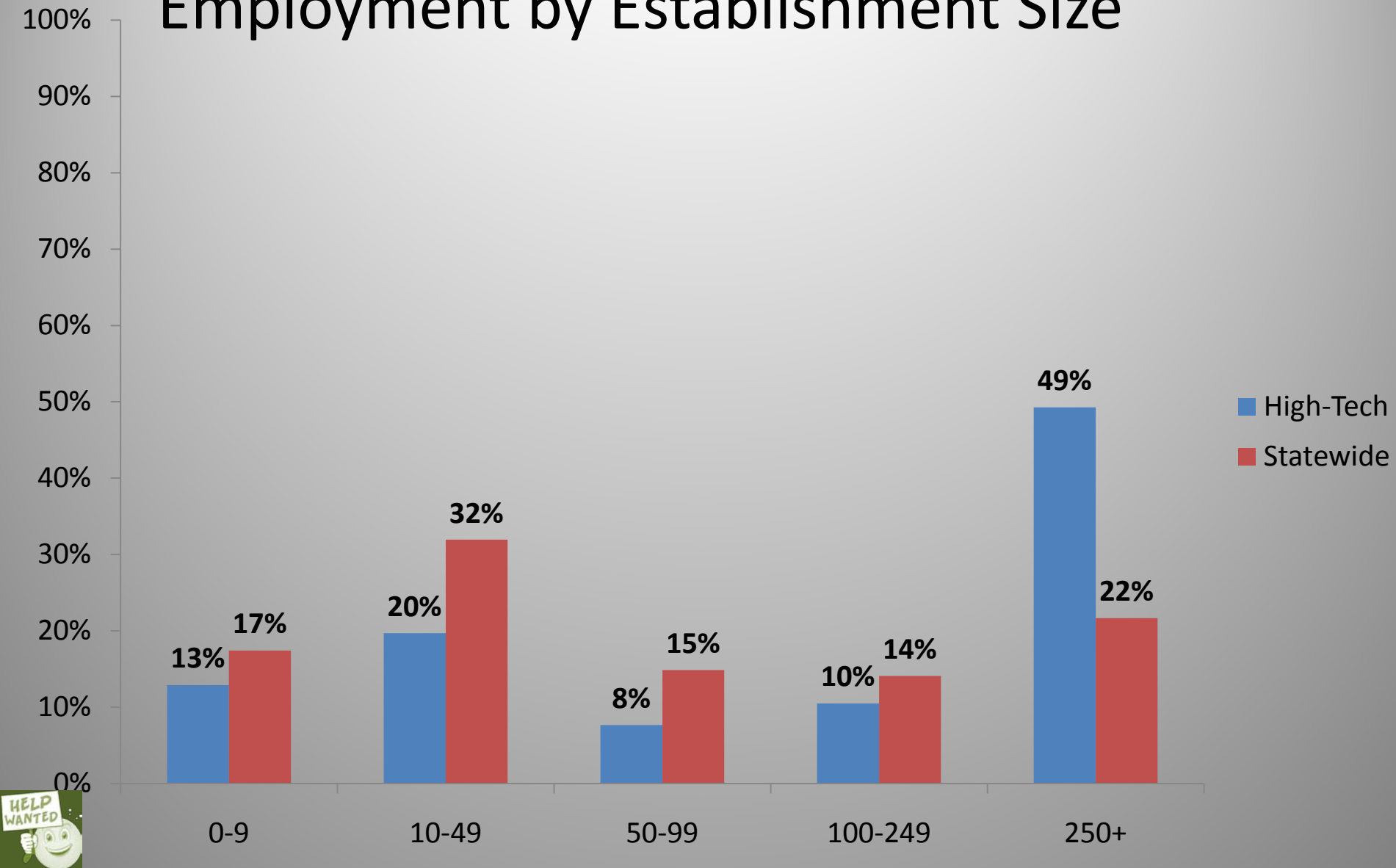


High-Tech Industry Percent of Employers by Establishment Size



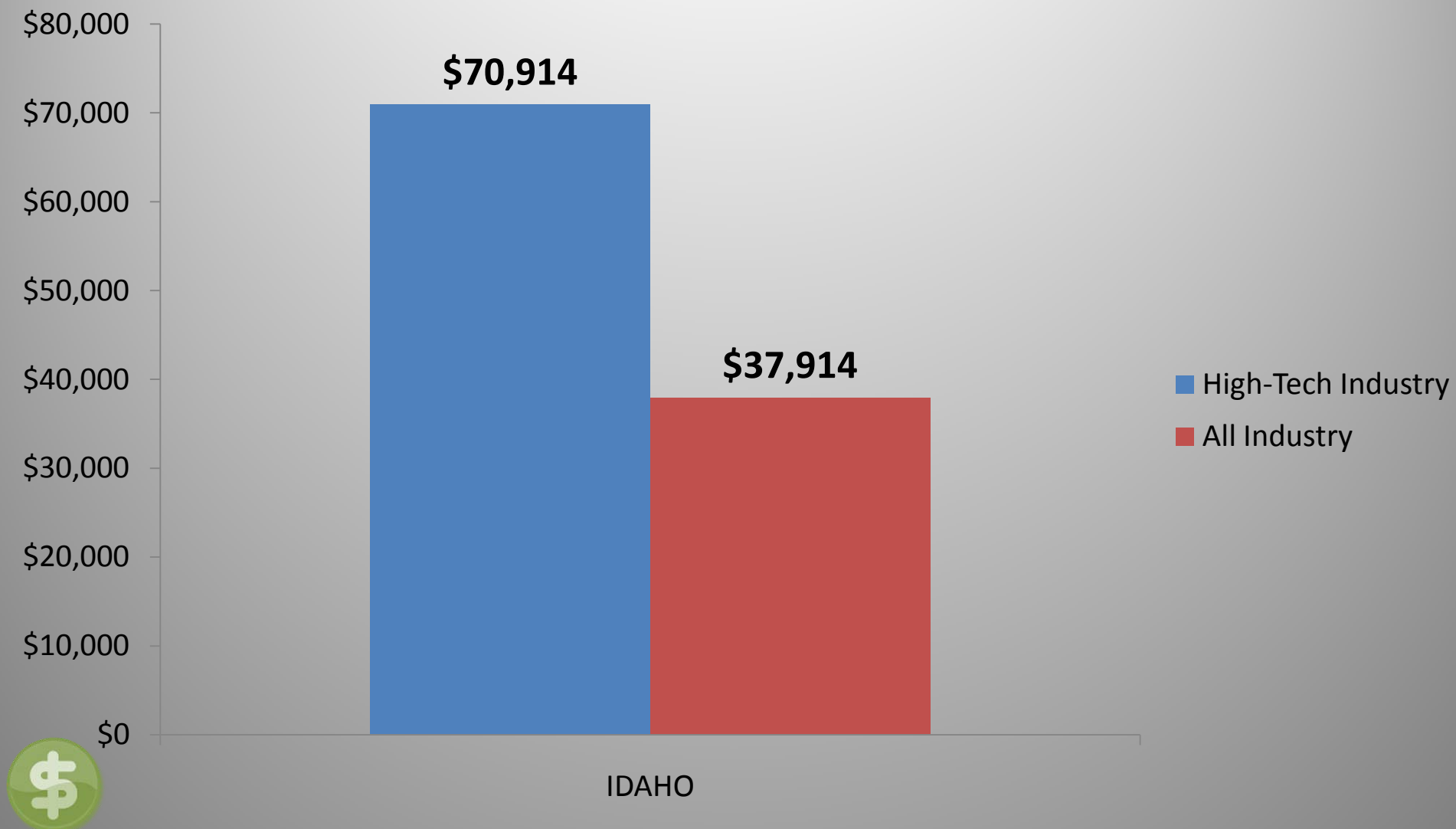


High-Tech Industry Percent of Employment by Establishment Size





Industry: High-Tech Earnings per Worker





High-Tech Industry Earnings per Worker, State High-Tech to State Total, National Ranking



2006

- 188%
- 3rd in US

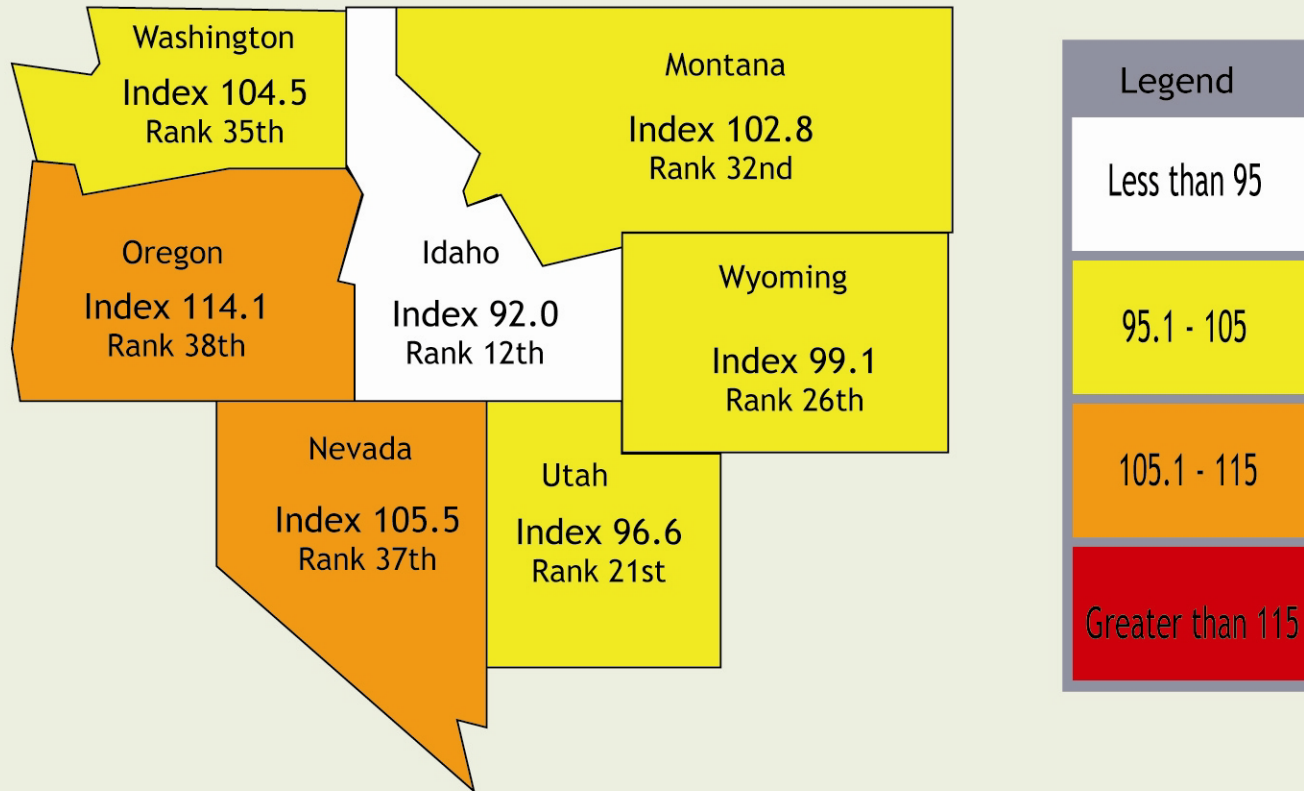
2008

- 187%
- 7th in US



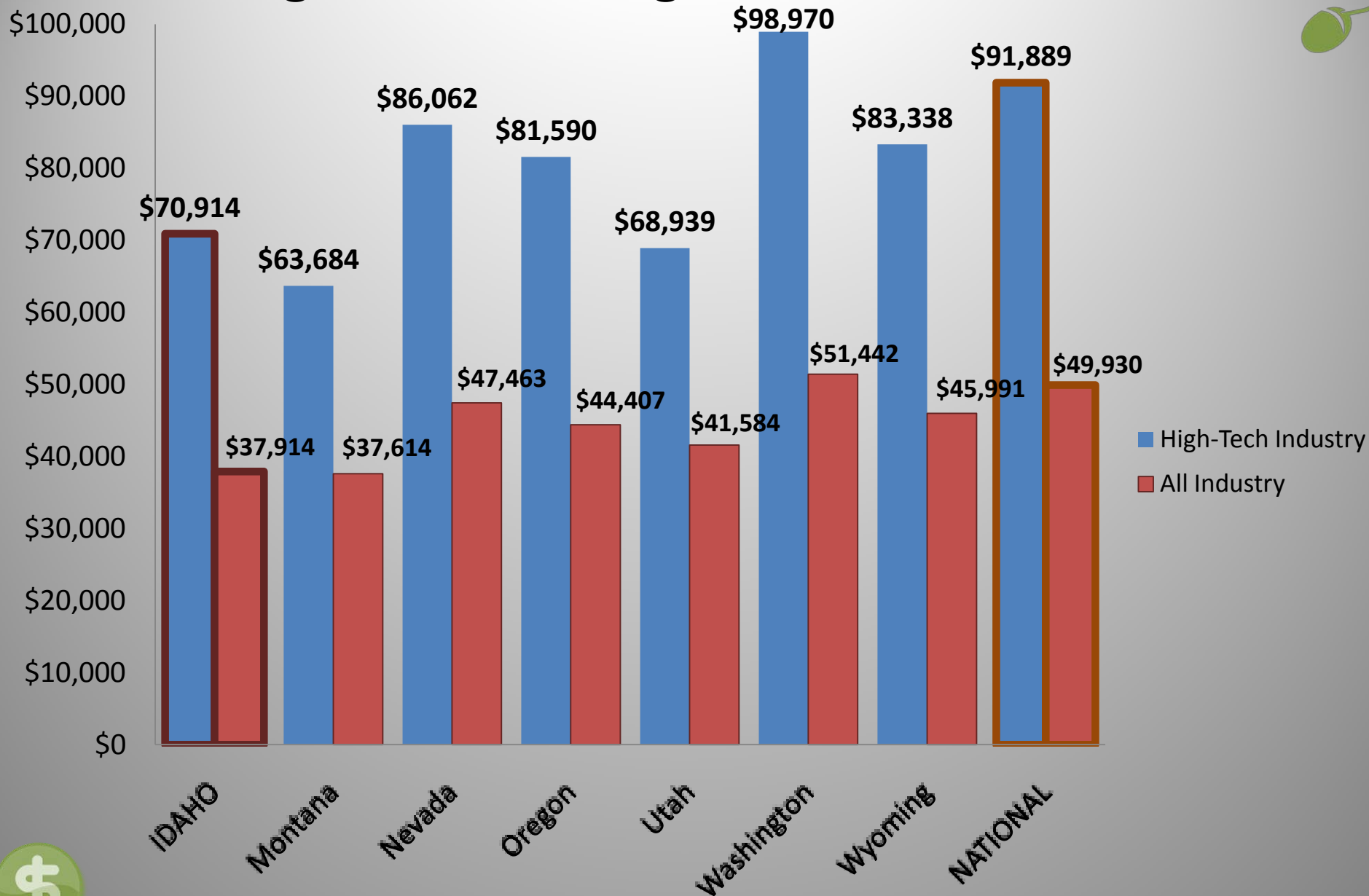
Cost of Living Index

Cost of Living Index (2009, Fourth Quarter)



Source: Missouri Department of Economic Development

High-Tech Earnings Per Worker





High-Tech Industry Earnings per Worker National Ranking



2006

- \$66,107
- 84.3%
- 31st in US

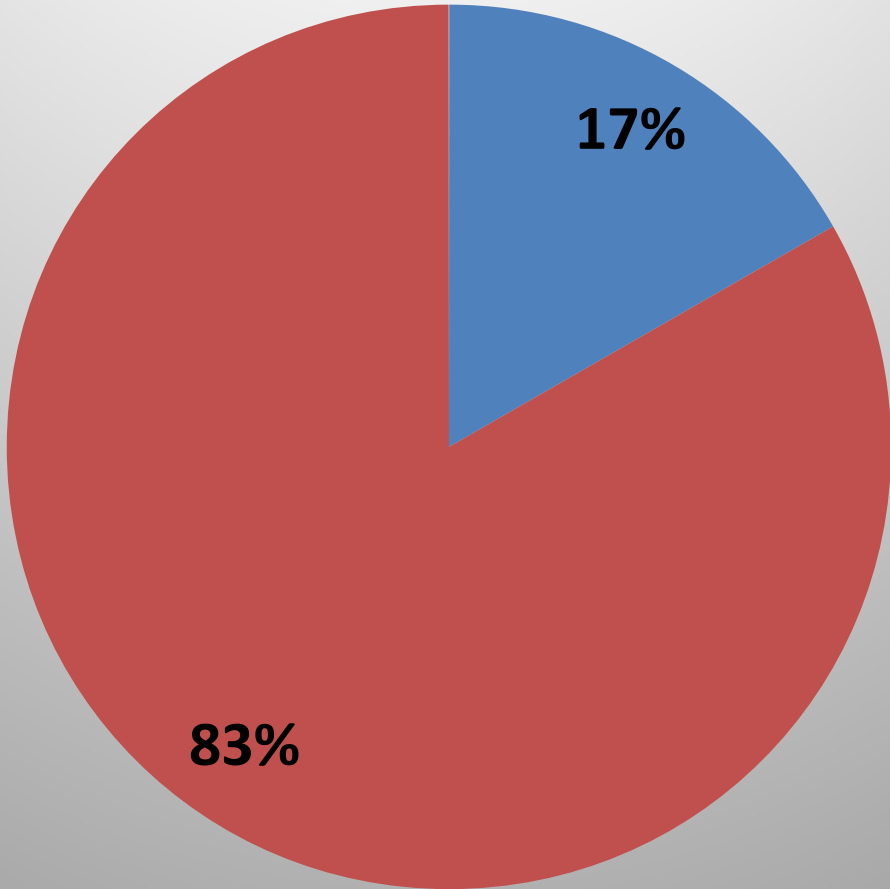
2008

- \$70,914
- 77.2%
- 40th in US





High-Tech Earnings as a Percent of Total Earnings



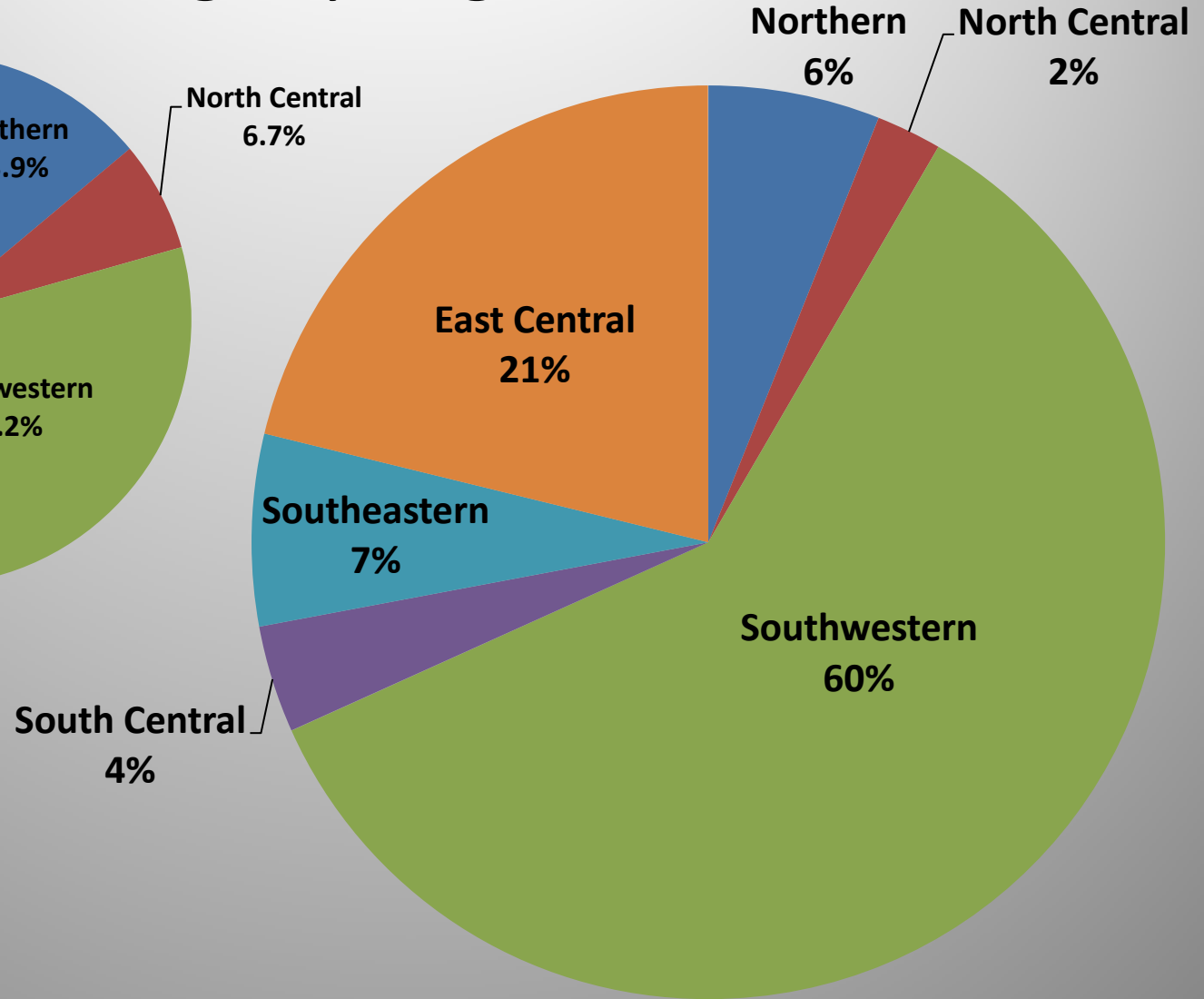
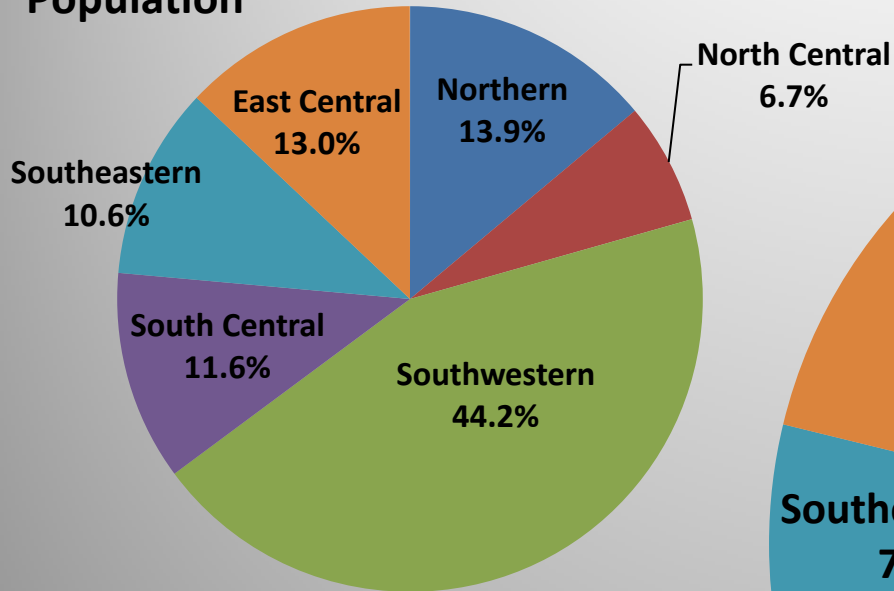
■ High-Tech Earnings (\$3,700,102,321)

■ Total Earnings (\$22,146,473,488)



Industry: Distribution of High-Tech Earnings by Region

Population





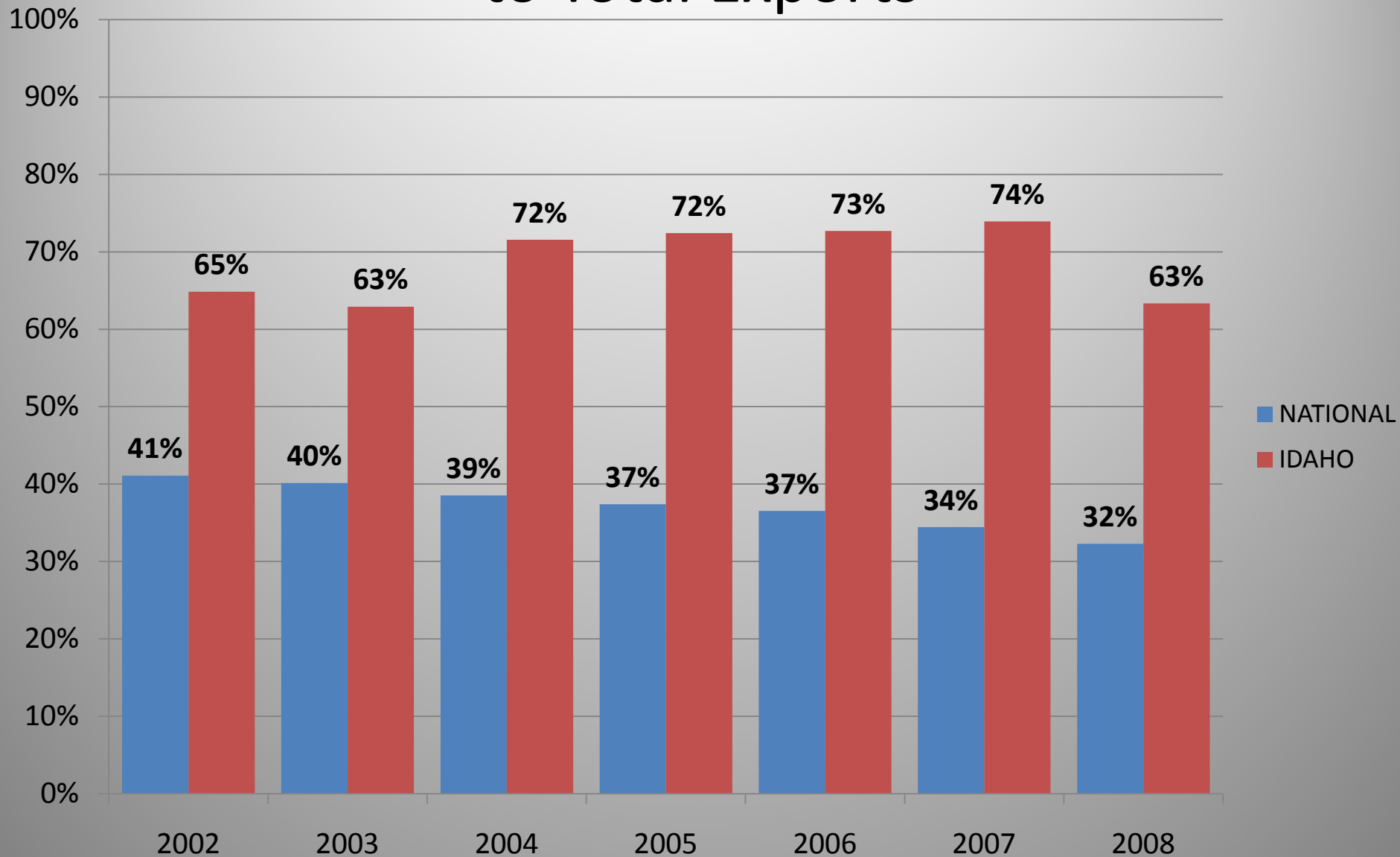
High-Tech Industry

Highest Employment by Level, 2008

High-Tech Industry: Highest Employment by Level					
Level NAICS	NAICS Title	Employment	Establishments	EPW	National EPW
Level I	3344 Semiconductor and electronic component mfg.	10,343	42	\$85,943	\$92,161
	5413 Architectural and engineering services	9,098	974	\$62,413	\$78,674
	5417 Scientific research and development services	7,730	137	\$86,445	\$103,147
	5415 Computer systems design and related services	5,211	827	\$52,624	\$88,929
	3341 Computer and peripheral equipment mfg.	3,594	25	\$135,551	\$140,261
Level II	5416 Management and technical consulting services	7,239	1,098	\$48,649	\$71,166
	4234 Commercial equip. merchant wholesalers	1,789	287	\$82,549	\$96,419
	2211 Power generation and supply	1,363	87	\$92,501	\$115,532
	3333 Commercial and service industry machinery	796	18	\$53,654	\$74,794
Level III	5511 Management of companies and enterprises	7,484	296	\$90,688	\$110,601
	5171 Wired telecommunications carriers	4,461	116	\$40,064	\$82,875
	3253 Agricultural chemical manufacturing	916	34	\$78,237	\$90,272
	8112 Electronic equipment repair and maintenance	764	112	\$42,370	\$50,196

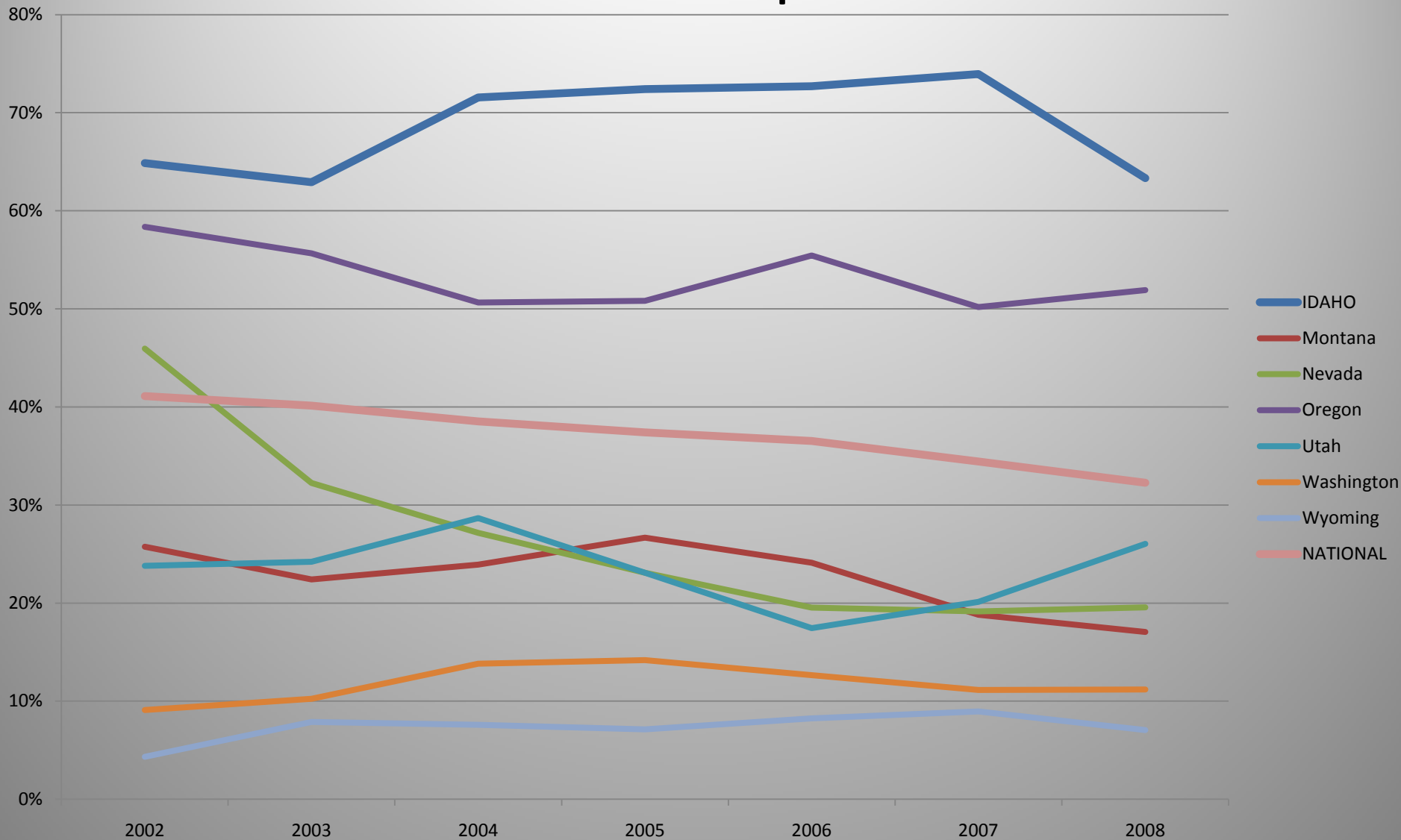


Percent of High-Tech Exports to Total Exports





Percent of High-Tech Exports to Total Exports





Occupations



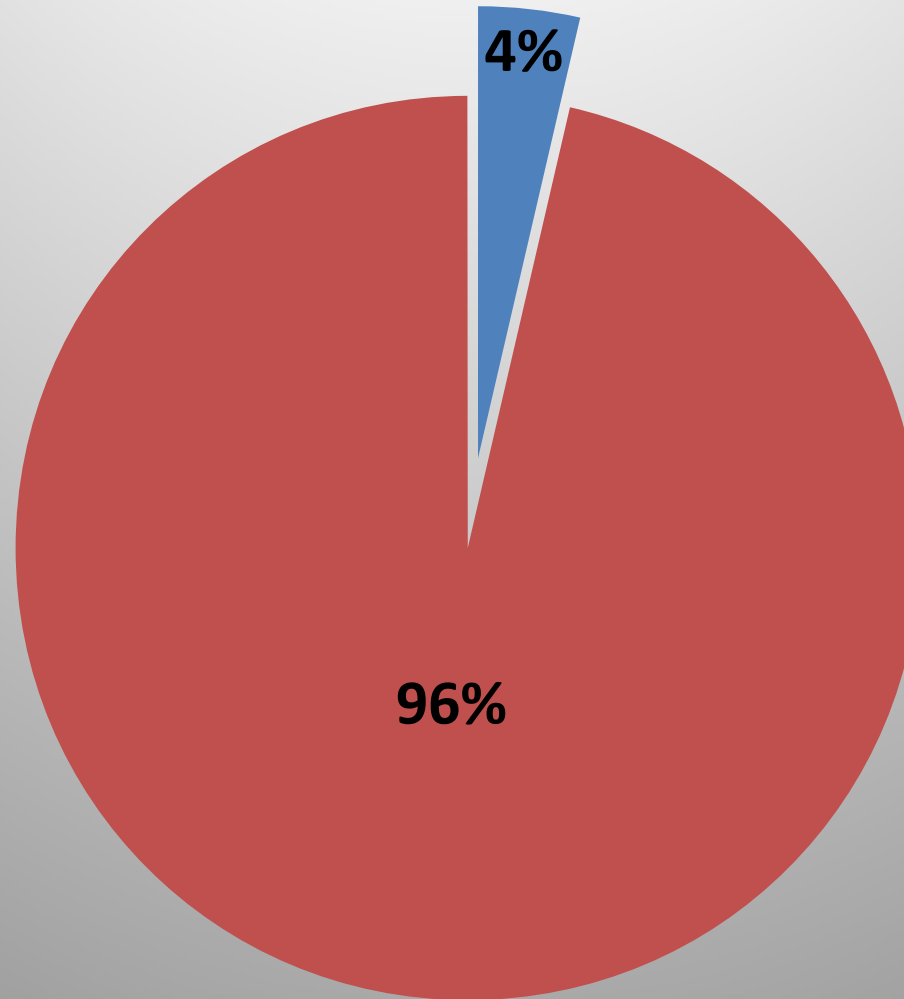
Employment



Wages



Occupation: Percent of High-Tech Employment, Idaho 2008



■ High-Tech Employment (34,868)

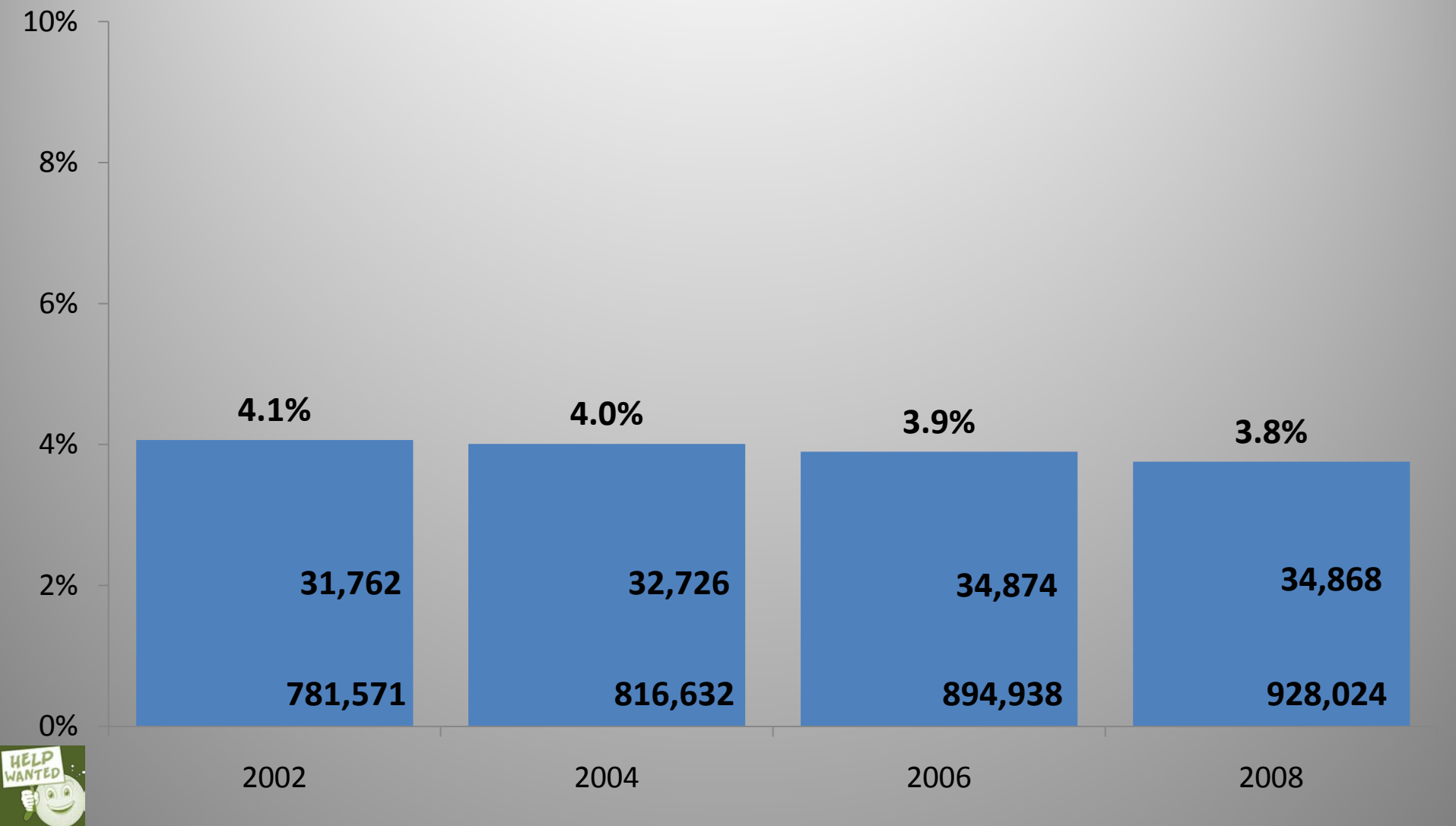
■ Total Employment (928,024)





Occupation:

Percent of High-Tech Employment, Idaho





Occupation:

Regional High-Tech Employment, Idaho

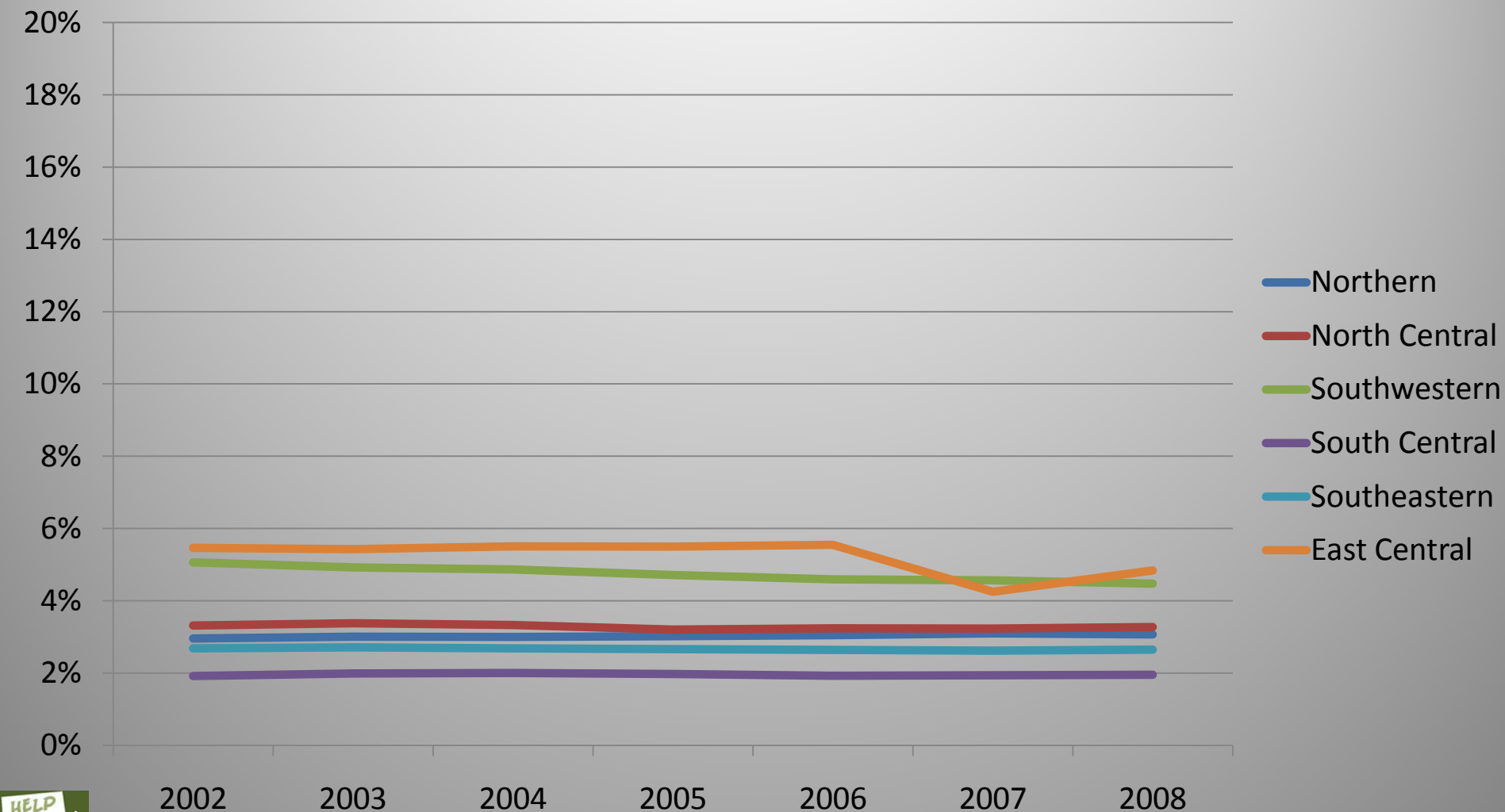
	2002	2004	2006	2008
IDAHO	31,762	32,726	34,874	34,868
Northern	2,849	3,136	3,513	3,707
North Central	1,985	2,039	2,042	2,119
Southwestern	17,439	17,547	18,483	18,492
South Central	1,973	2,069	2,150	2,285
Southeastern	2,143	2,239	2,325	2,418
East Central	5,386	5,709	6,375	5,862





Occupation:

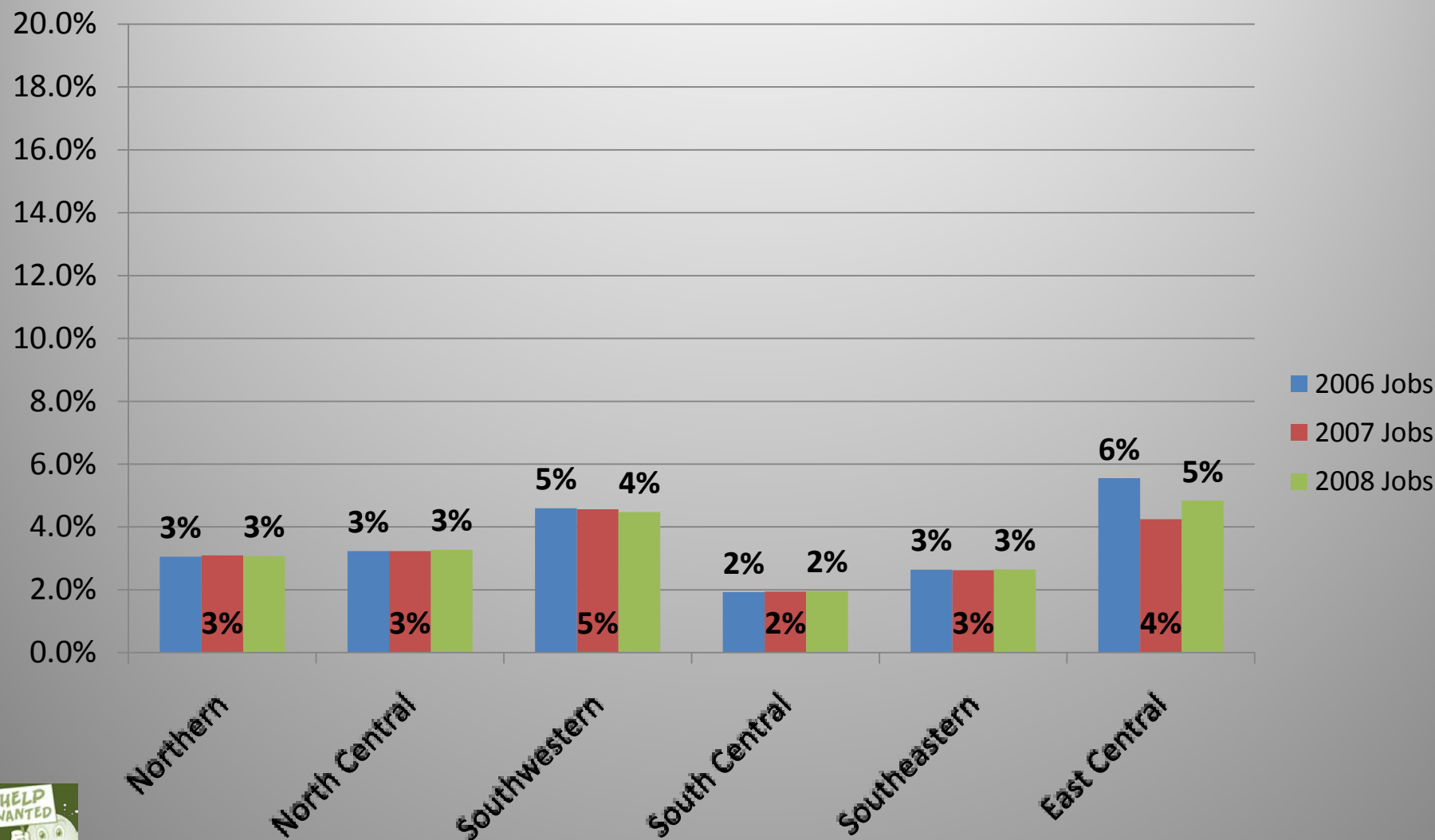
Regional High-Tech Employment, Idaho





Occupation:

Percent of Regional High-Tech Employment





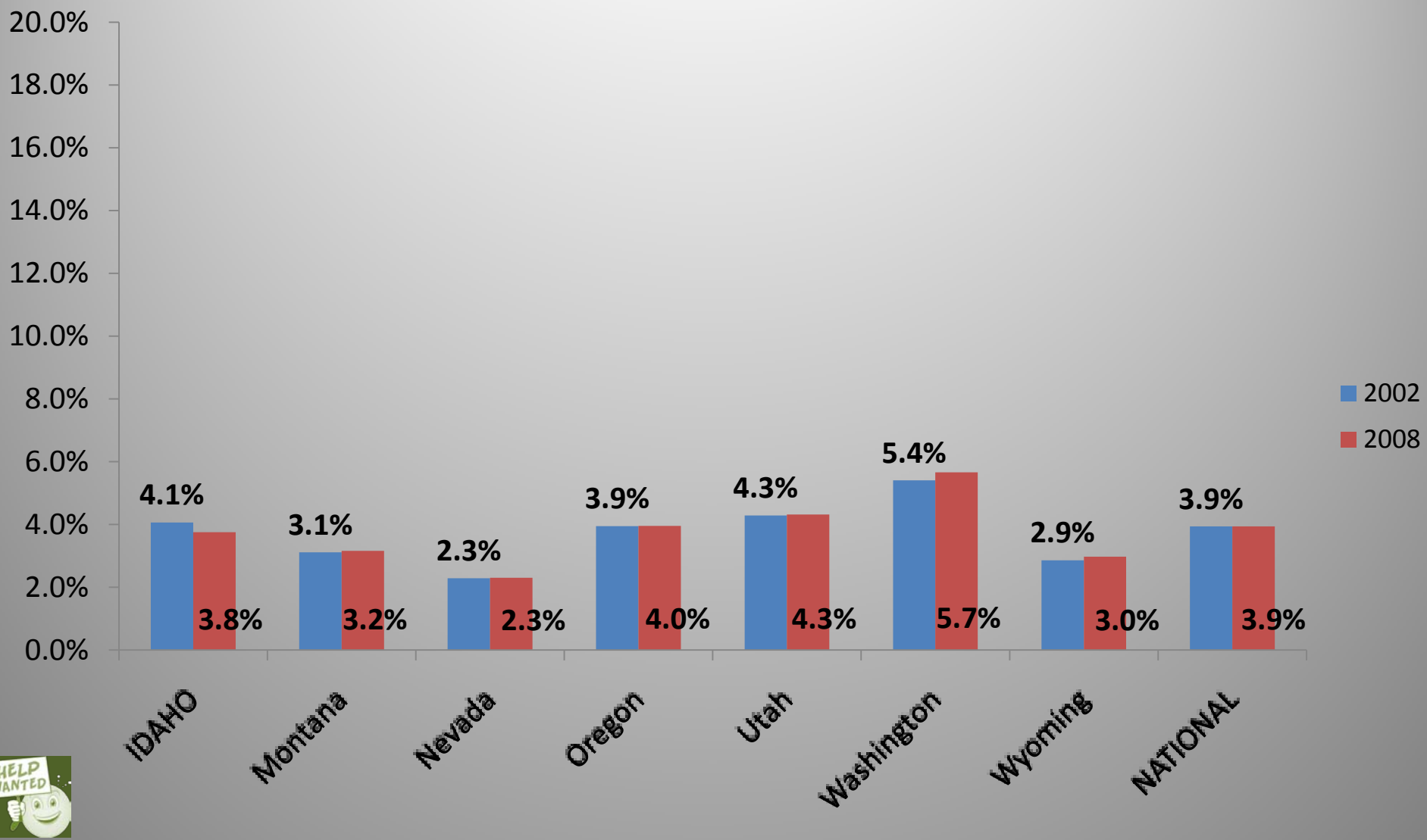
Occupation:

Regional High-Tech Employment, East Central

SOC	Description	2006-2007 Employment Decrease	Median Wage	10% Wage
	East Central	(1,258)	\$31.26	\$18.74
19-4021	Biological technicians	(865)	\$13.96	\$9.46
19-1023	Zoologists and wildlife biologists	(103)	\$21.36	\$13.63
19-2012	Physicists	(61)	\$48.71	\$23.59
11-9121	Natural sciences managers	(55)	\$34.44	\$15.71
19-4051	Nuclear technicians	(43)	\$22.70	\$11.77
15-1011	Computer and information scientists, research	(38)	\$38.12	\$19.75
19-1042	Medical scientists, except epidemiologists	(36)	\$17.62	\$10.32
17-3031	Surveying and mapping technicians	(30)	\$18.30	\$12.38

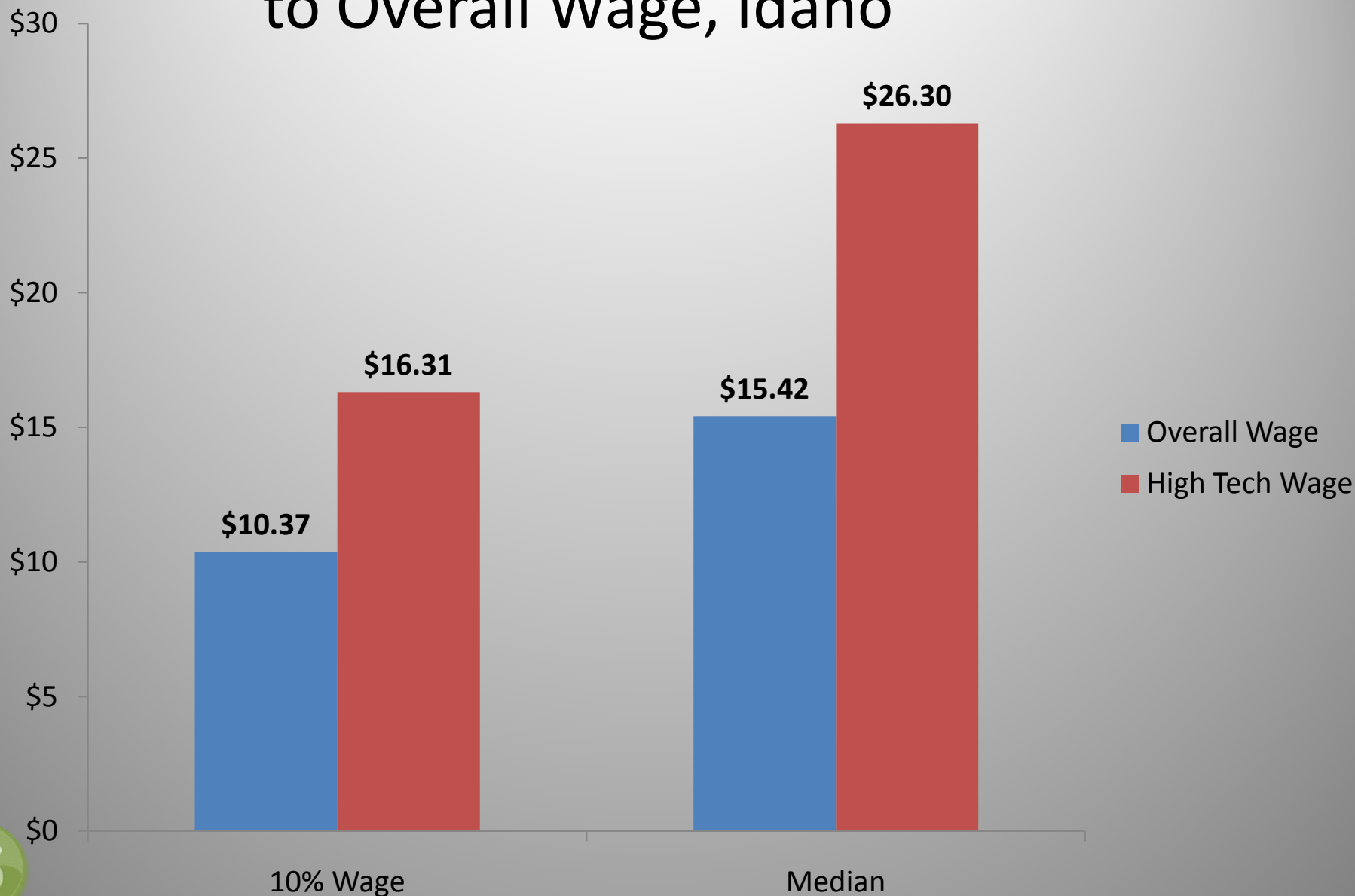


Occupation: Percent of High-Tech Employment Neighboring State Comparison



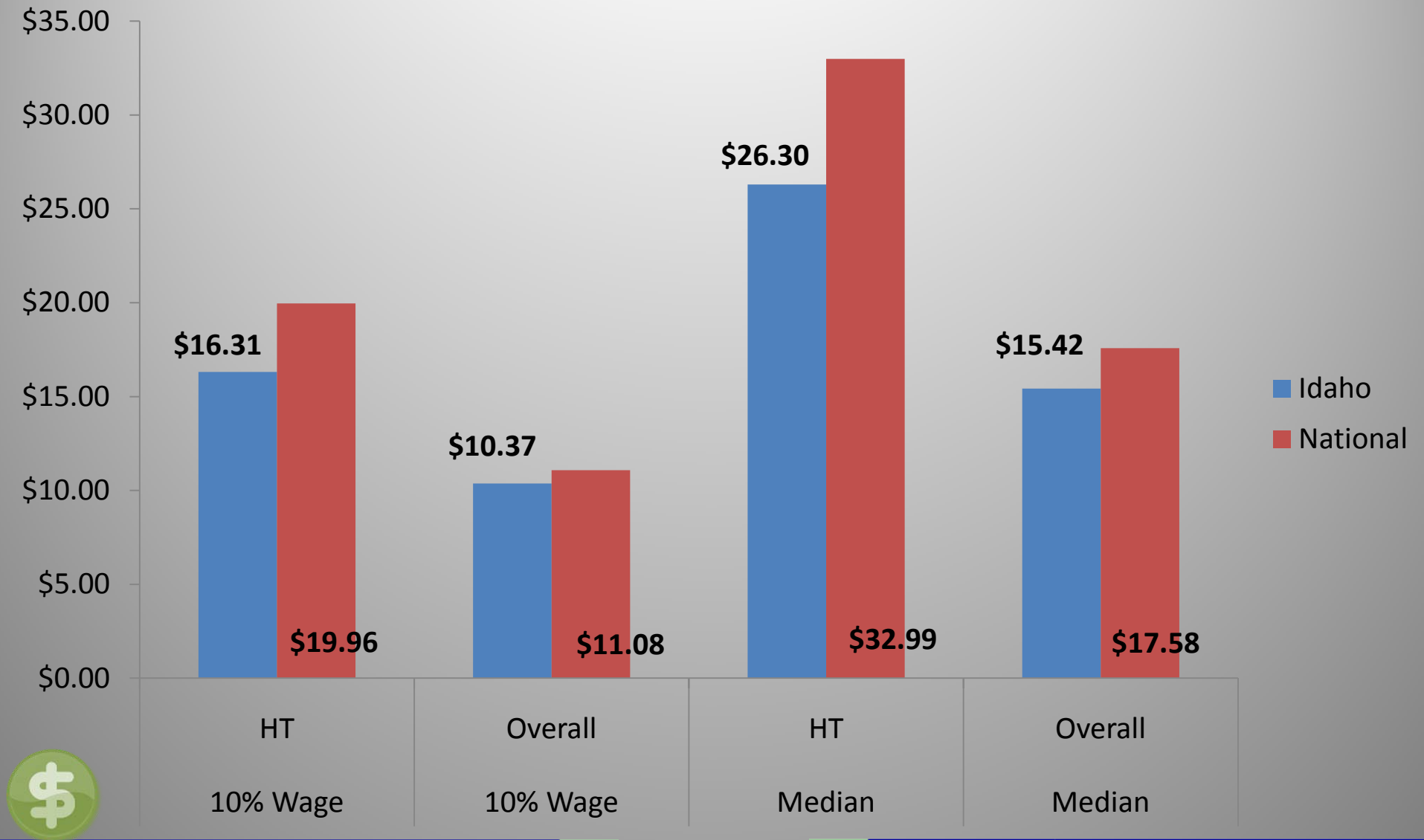


Occupation: High-Tech Wage to Overall Wage, Idaho



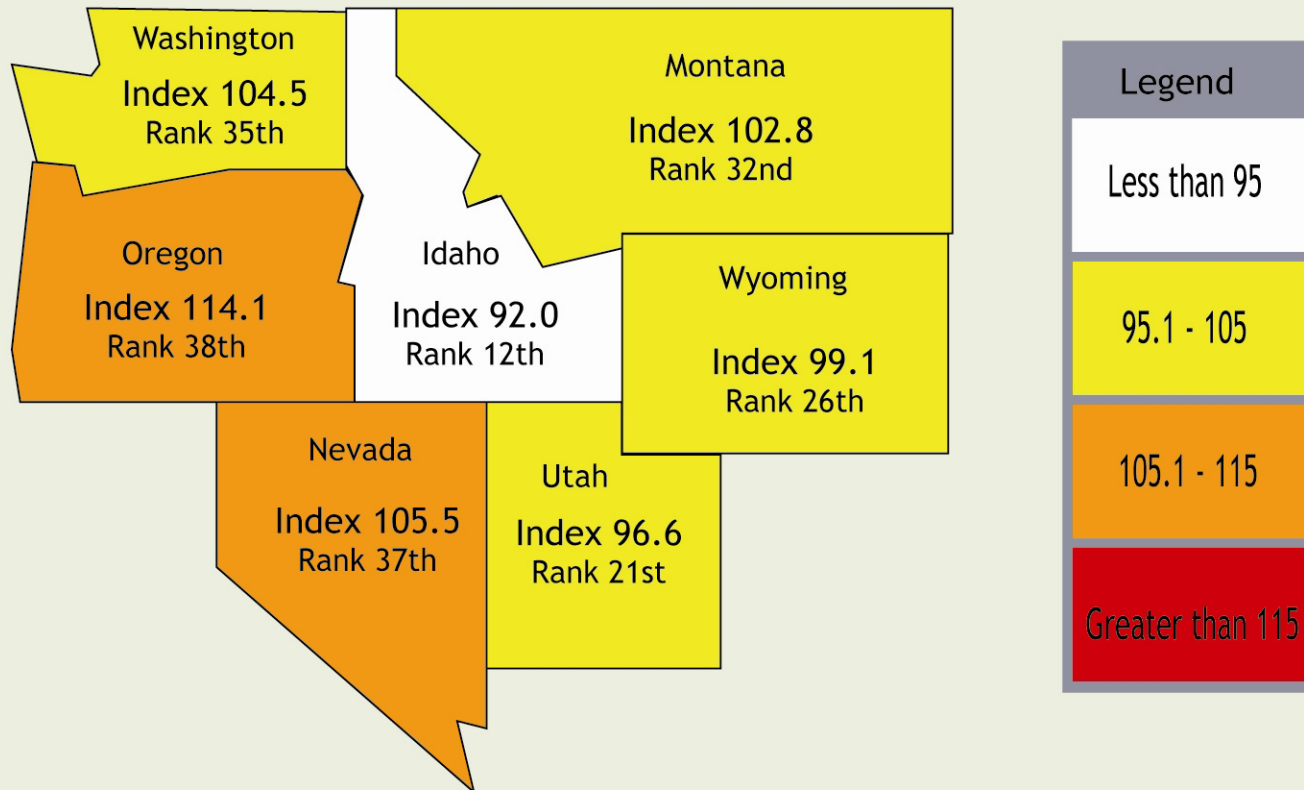


Occupation: High-Tech Wages National Comparison



Cost of Living Index

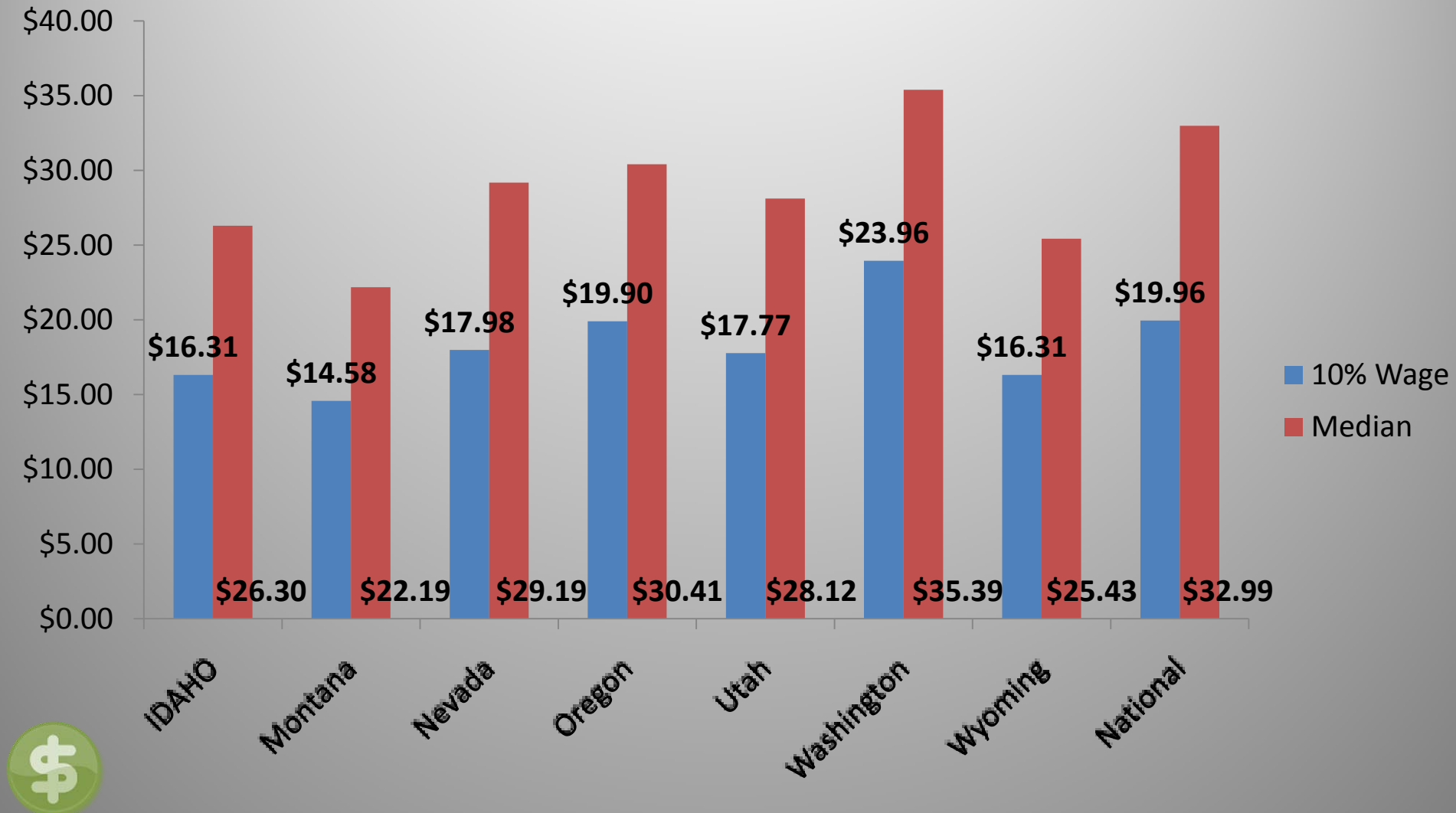
Cost of Living Index (2009, Fourth Quarter)



Source: Missouri Department of Economic Development

Occupation: High-Tech Wages

Neighboring States





Projected Top 10 High-Tech Occupations in Idaho



SOC	Occupational Title	2006 Employment	2016 Employment	Percent Change
15-1081	Network Systems & Data Communications Analysts	569	884	55.4%
15-1031	Computer Software Engineers, Applications	793	1,199	51.2%
19-4092	Forensic Science Technicians	48	68	41.7%
15-1071	Network & Computer Systems Administrators	1,232	1,723	39.9%
15-1051	Computer Systems Analysts	1,038	1,385	33.4%
15-1061	Database Administrators	356	466	30.9%
17-2072	Electronics Engineers, Except Computer	314	409	30.3%
15-1032	Computer Software Engineers, Systems Software	1,635	2,109	29.0%
19-4091	Environmental Science & Protection Technicians, Including Health	247	314	27.1%
17-2081	Environmental Engineers	317	402	26.8%



Hot Jobs - Definition



Idaho's hot jobs are the jobs that on average rank high in three major criteria:

- the abundance of jobs in the economy
- jobs which are growing the fastest
- jobs with the highest pay

The **hot jobs** are then disaggregated by education and training level.



High-Tech Hot Jobs



Hot Job Rank	Title	Annual Openings	Median	Education & Training
5	Computer software engineers, applications	53	\$37.59	Bachelor's degree
6	Computer software engineers, systems software	71	\$39.65	Bachelor's degree
12	Computer systems analysts	63	\$28.84	Bachelor's degree
15	Network and computer systems administrators	77	\$22.20	Bachelor's degree
20	Network systems and data communications analysts	44	\$26.31	Bachelor's degree
31	Computer support specialists	173	\$17.04	Associate degree
38	Computer and information systems managers	39	\$37.03	Bachelor's degree & work experience
53	Industrial engineers	57	\$36.25	Bachelor's degree
96	Database administrators	15	\$29.71	Bachelor's degree
97	Electronics engineers, except computer	17	\$32.23	Bachelor's degree



Occupation High-Tech Highlight: Wage and Employment

- **15-1031 Computer Software Engineers, Applications**
 - “Develop, create and modify general computer applications software or specialized utility programs...”
- **15-1032 Computer Software Engineers, Systems Software**
 - “Research, design, develop and test operating systems-level software, compilers and network distribution software for medical, industrial, military, communications, aerospace, business, scientific and general computing applications...”





Occupation High-Tech Highlight: Wage and Employment

15-1031 Computer Software Engineers, Applications

- Develop, create and modify general computer applications software or specialized utility programs. Analyze user needs and develop software solutions. Design software or customize software for client use with the aim of optimizing operational efficiency. May analyze and design databases within an application area, working individually or coordinating database development as part of a team. Exclude "Computer Hardware Engineers" (17-2061).



15-1031 Computer Software Engineers, Applications- Idaho Regions



Employment

15-1031	2002	2008	% Change
STATEWIDE	761	1,004	31.9%
Northern	77	125	62.3%
North Central	21	28	33.3%
Southwestern	441	537	21.8%
South Central	21	24	14.3%
Southeastern	58	82	41.4%
East Central	142	207	45.8%
NATIONAL	434,740	536,310	23.4%

Median Wage



Median	\$33.01	\$27.99	\$22.95	\$35.12	\$19.74	\$23.35	\$37.56	\$39.09
10% Wage	\$19.94	\$15.79	\$12.00	\$21.55	\$12.89	\$15.96	\$21.89	\$24.28

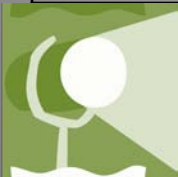
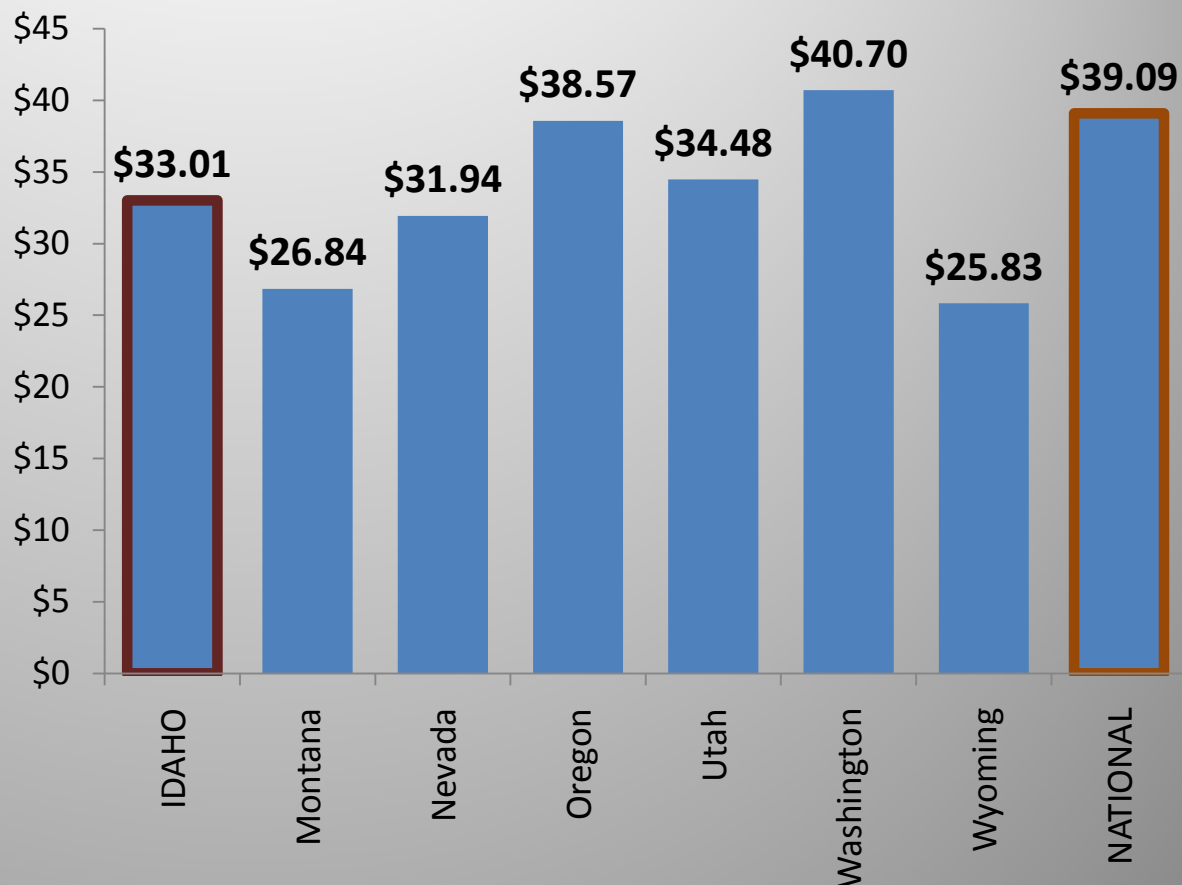


15-1031 Computer Software Engineers, Applications- Neighboring States

Employment

15-1031	2002	2008	% Change
IDAHO	761	1,004	31.9%
Montana	535	660	23.4%
Nevada	1,108	1,578	42.4%
Oregon	6,741	8,371	24.2%
Utah	3,732	5,214	39.7%
Washington	19,681	27,914	41.8%
Wyoming	192	250	30.2%
NATIONAL	434,740	536,310	23.3%

Median Wage



Median	\$33.01	\$26.84	\$31.94	\$38.57	\$34.48	\$40.70	\$25.83	\$39.09
10% Wage	\$19.94	\$17.84	\$17.42	\$25.73	\$21.24	\$29.44	\$17.58	\$24.28



Occupation High-Tech Highlight: Wage and Employment

15-1032 Computer Software Engineers, Systems Software

- Research, design, develop and test operating systems-level software, compilers and network distribution software for medical, industrial, military, communications, aerospace, business, scientific and general computing applications. Set operational specifications and formulate and analyze software requirements. Apply principles and techniques of computer science, engineering and mathematical analysis.



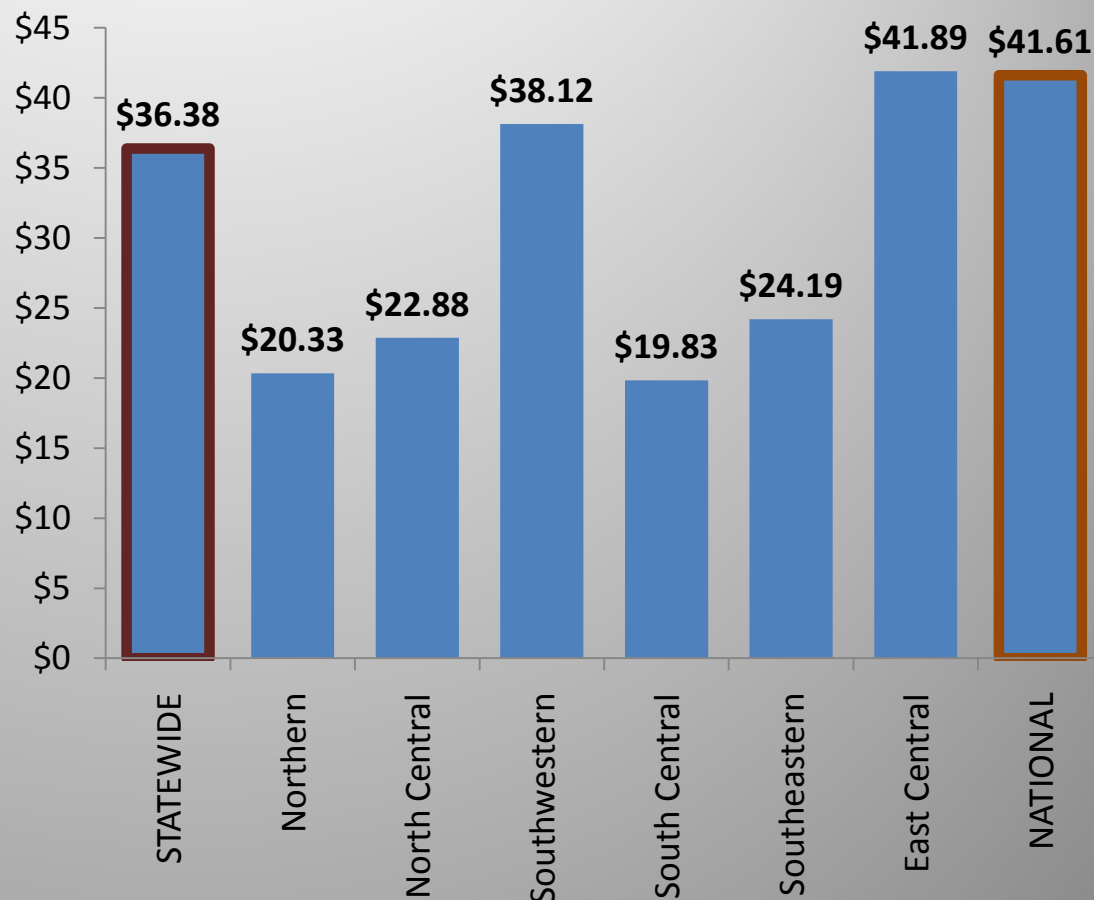
15-1032 Computer Software Engineers, Systems Software- Idaho Regions



Employment

15-1032	2002	2008	% Change
STATEWIDE	1,292	1,396	8.0%
Northern	32	53	65.6%
North Central	21	28	33.3%
Southwestern	912	910	-0.2%
South Central	23	28	21.7%
Southeastern	93	108	16.1%
East Central	211	268	27.0%
NATIONAL	378,832	420,742	11.1%

Median Wage



Median	\$36.38	\$20.33	\$22.88	\$38.12	\$19.83	\$24.19	\$41.89	\$41.61
10% Wage	\$18.56	\$12.59	\$12.87	\$15.93	\$13.54	\$17.04	\$29.67	\$25.66

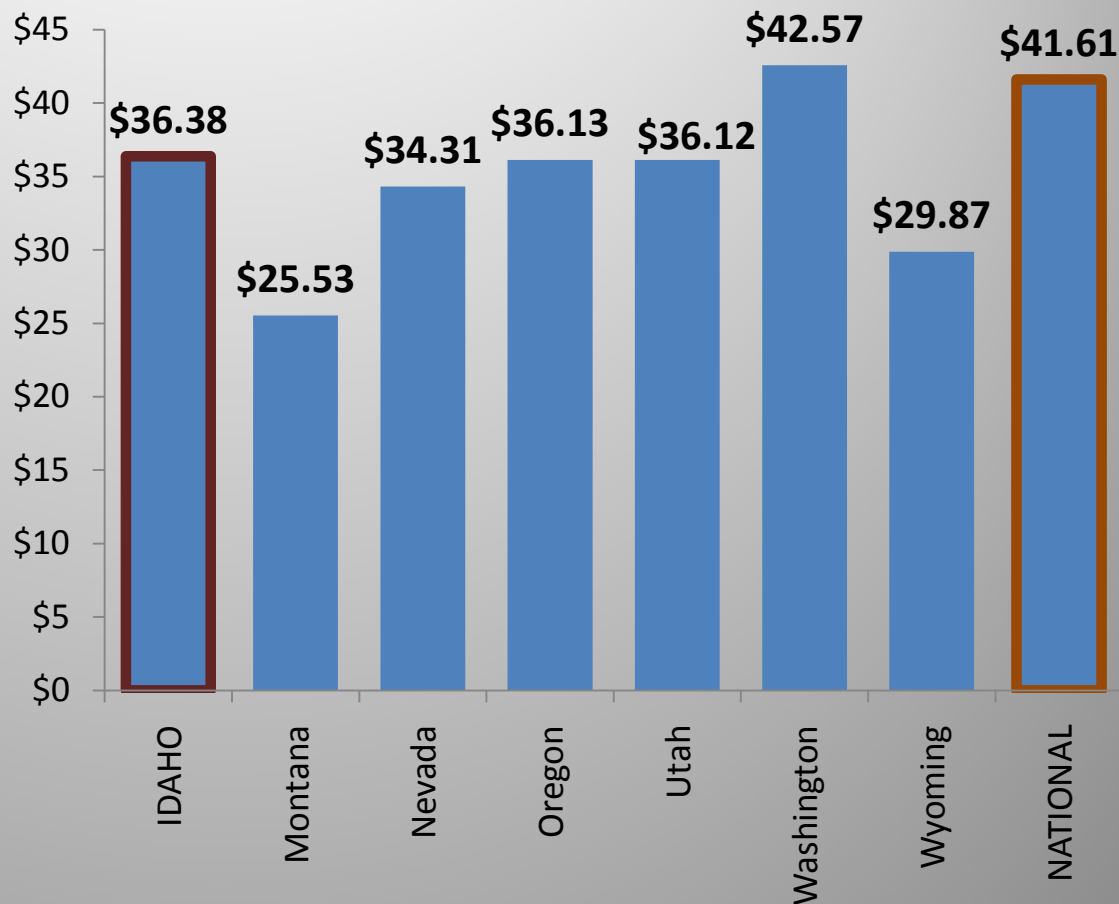
15-1032 Computer Software Engineers, Systems Software- Neighboring States



Employment

15-1032	2002	2008	% Change
Idaho	1,292	1,396	8.0%
Montana	237	270	13.9%
Nevada	1,327	1,726	30.1%
Oregon	2,903	3,422	17.9%
Utah	3,873	4,964	28.2%
Washington	13,729	17,937	30.7%
Wyoming	126	153	21.4%
National	378,832	420,742	11.1%

Median Wage



Median	\$36.38	\$25.53	\$34.31	\$36.13	\$36.12	\$42.57	\$29.87	\$41.61
10% Wage	\$18.56	\$15.23	\$21.70	\$24.12	\$23.29	\$30.73	\$17.44	\$25.66



High-Tech Key Findings



- Industries
 - 7% Establishments
 - 7% Employment
 - 17% Earnings
 - Number of establishments has grown
 - 1,498 since 2002
 - 533 since 2006





High-Tech Key Findings Cont.



- Occupations
 - Gained 3,106 high-tech occupational jobs since 2002
 - No growth in high-tech occupational employment since 2006
 - Projected increase for many high-tech occupations



High-Tech Key Findings Cont.

- Accurate counts of the number of high-tech employers are available.
- Estimates of the number of jobs for specific occupations, as well as wage information for those jobs, are available for the previous year.
- Occupational data at the regional level is sometimes unreleasable due to small sample sizes.
- Wage data can be compared to national averages and to border states but used with caution for time comparisons.
- Lengthier studies of gap analyses can be conducted for licensed occupations with additional funding.
- For each occupation, the number of jobs per 100,000 total population can be found for the regions, state and nation.



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